Vermont Telecom Regulatory Policy

Several trends and pressures are setting the state's regulatory agenda for telecommunications service. Prominent among trends are growing consumer demand for ubiquitous high-speed access to the Internet and mobile voice and data service. Data networks are essential tools for many Vermont companies and institutions, and telecommunications networks are the backbones and access points for these networks. Meanwhile, technological advancement is increasing the overlap of formerly separate telecommunications service platforms or networks, enabling consumers to substitute one telecommunications service for another, and increasing the prospect for significant inter-modal competition. Wireless companies, for instance, are expanding their geographic scope of coverage, improving voice quality, and offering all-distance service at flat or low per-minute rates. Cable television system operators introduced high-speed Internet access service within the past four years and will likely introduce local phone service within the next two years.

Wireline telecommunications companies (both local and inter-exchange), to varying degrees, are experiencing revenue pressures as a result of this inter-modal competition and product substitution, as well as from other wireline companies. Growth in local usage revenue (through local measured service charges) and sales of additional phone lines have flattened or declined as consumers migrate from low-speed Internet access service (which is accessed by making local phone calls) to high-speed Digital Subscriber Line (DSL) or cable-modem access services. Some portion of consumers have migrated much of their long-distance calling to attractive rate plans offered by wireless telephone carriers.

All telecommunications carriers are adapting by introducing service bundles that expand into their competitors' traditional niches.

All telecommunications carriers are adapting to these pressures and to consumer demand by introducing service bundles that expand into their competitors' traditional niches. Local phone companies are offering long-distance and high-speed Internet access. Internet service providers are offering local phone service. Long-distance companies are offering local phone service. Wireless companies are offering long-distance and even high-speed Internet access. With increased competition, companies that offer a variety of services may lose ground in their traditional market segment, but make offsetting gains in other market segments. Carriers are also reducing prices where competition necessitates reductions, and reducing costs and capital expenditures on market segments or geographic areas that are not strategic priorities or where productivity can be improved.

Regulatory policy will continue to have a role in Vermont's telecommunications marketplace, often a critical role. While remaining, that role must evolve. The challenge for regulators is to determine and implement the combination of regulations and forbearance that best accomplishes the state's policy objectives.

NONDOMINANT REGULATION

The number of choices for telecommunications service is increasing. Some markets, like local service, still bear some of the marks of their monopoly past while becoming competitive. Others, like long distance, have essentially made the transition from monopoly service to competition. Still others, like wireless service, have grown up in a competitive environment. As of June 2003, there were more than 500 Competitive Local Exchange Carriers (CLECs) and long distance carriers registered with the Public Service Board (PSB). Some of these carriers have a material customer base in Vermont, while many others do little to no business in Vermont. Only a few companies operating in Vermont still have any significant market power—the rest are "nondominant." Yet, the same certificate of authority (a "Certificate of Public Good" or "CPG"), change-of-control consent, and tariff requirements apply to all, which imposes a substantial administrative burden on regulators and carriers alike. The volume of telecommunications tariffs and tariff revisions reviewed by the Public Service Department (PSD) and the PSB is large—approaching one thousand per year. The PSB has allowed nondominant carriers to file "rate bands," reducing the need for companies to file individual rate changes. Still, there is little residual value to tariffs for nondominant carriers. They impose a burden on the companies filing them and consume PSD and PSB staff resources to review and approve them. Furthermore, tariffs lay out terms and conditions that bind consumers independent of the knowledge that they have of the tariff (which is usually little to none). For most companies, the job of consumer protection could be more effectively accomplished by instituting a set of basic generic consumer protection rules in place of tariffs, and allowing terms and conditions to be set on the basis of contracts or other agreements between service providers and their customers. The PSB gained such authority in 2000 through Act 67 (30 V.S.A. §227c), which allows it to modify, reduce or suspend certain tariff and miscellaneous transaction preapprovals applicable to nondominant carriers if it makes certain determinations. These determinations are that remaining requirements will be sufficient to assure that such carriers' rates and practices are just, reasonable and not unreasonably discriminatory, and that the public will be afforded at least as much protection as the requirements being suspended or reduced. This was in addition to preexisting authority that the PSB has to reduce or suspend regulation in a competitive telecommunications market where no competitor has the power to set prices for the service (30 V.S.A. §227a).

As of 2004, it appears that certain markets, especially the local telecommunications service market, are still composed of both "dominant" and "nondominant" carriers. There are trends afoot, however, that are likely to erode the dominance of incumbent local telephone companies either over a shorter or longer period of time. These trends include increased use of wireless technology, improvements in cable telecommunications, and voice service provided over the Internet. Incumbents may become nondominant in the markets for certain services before they become nondominant across the board. While new competitors entering the telecommunications market in Vermont are obvious candidates for nondominant regulation, it is important to put in place a framework of nondominant regulation that can readily accommodate even incumbents as they lose dominance in various markets. In addition, it may be appropriate to examine whether the markets for certain telecommunications services have no dominant competitor.

In most circumstances, a company may be considered to have lost dominance in a market when it no longer has "market power," the ability to set prices for the relevant geographic and functional market for a particular service. When looking at market power, it is important to consider at least whether any competitor or competitors offers a sufficient quantity of similar or equivalent services, and whether there is reasonable ease of entry into the market for providers of these services. "Nondominant regulation" should not be seen merely as a way of separating one type of company from another, but should be seen as an overall direction for regulation—as competition increases, regulators should look for instances where legacy regulations no longer suit the situation. Those regulations should be eliminated or reformed as the new situation requires.

In 2004, the PSB released informal drafts of new rules that were intended to establish generic consumer protections applicable to telecom service, establish some relaxed regulatory requirements for nondominant telecom carriers, and define which carriers would be considered "nondominant." As of this writing, the PSB is taking comment on its proposal. Establishing a framework for nondominant regulation and simplifying and streamlining regulation for nondominant carriers should be done soon in the interest of providing consumers with a wide array of choices and allowing the state to re-focus its activities.

Policies

- State regulation should only continue where conditions still warrant it.
- With regard to nondominant carriers and telecommunications markets with no dominant competitor, the PSD, PSB, and other state agencies as applicable, should focus on activities such as:
  - Establishing and enforcing "rules of the road" that allow all carriers to efficiently compete yet interact and cooperate as needed to deliver seamless telecommunications services (for example, regarding intercarrier compensation, traffic exchange and interconnection);
  - Establishing generic rules against precipitous or capricious loss of essential services, and enforcing them when problems arise;
  - Establishing generic rules against unfair and deceptive trade practices and consumer fraud and enforcing them when problems arise;
  - Establishing generic rules requiring truth-in-marketing (and billing) and enforcing them when problems arise;
  - Investigating and ordering corrective action when service quality levels threaten public safety or other essential activities;
  - Requiring and enforcing compliance with a very small number of necessary general industry obligations, such as support for E 9-1-1.
  - Collecting a basic level of information about the industry, including the identity and contact information for companies, and basic statistics on the industry.

Strategies/Action Plans

- The PSB should implement rules that reduce traditional regulatory requirements on nondominant carriers and establish generic consumer protections suitable for a competitive marketplace.

- Nondominant carrier rules should contain mechanisms for incumbent carriers to move to "nondominant" status as the level of competitive pressure rises, and state regulators should work with incumbent companies to establish greater clarity about when these companies or certain markets will be considered nondominant.

ALTERNATIVE REGULATION

Alternative regulation forms a bridge that connects the worlds of traditional monopoly utility regulation and nondominant regulation. Alternative regulation allows the state and regulated companies to craft a plan that sets a framework of certain objectives and, within the boundaries of that framework, allows a company subject to the plan to act more like a competitive company would. To date, only Verizon and its predecessors have been under alternative regulation in Vermont. Since April 2000 Verizon has been operating under a five-year alternative regulation plan. The Plan required phased, selective rate reductions at the outset, and streamlined requirements and approvals necessary for Verizon to introduce new services and enter service agreements with individual customers. The Plan also established retail service quality benchmarks and a customer credit mechanism in the event that Verizon did not obtain the benchmarks. Verizon was also exempted from cost-of-service regulation during the period of the Plan. As of 2004, the PSB has begun to investigate whether the present plan has obtained the statutory objectives and will consider what, if any, successor alternative regulation plan should be established. Circumstances have also changed since the last alternative regulation plan was implemented in Vermont. Competition in retail services, while still young, has increased and has spread in some areas of the state to the residential market as well as the business market. In 2004 the need for specific network modernization steps is clearer, as is the need for broadband services.

It may also be time to consider alternative regulation for independent companies that have not been under this form of regulation for reasons that are somewhat different. As independent local phone companies seek to expand the scope of services they offer (some of which are not subject to PSB regulation), setting cost-based rates for services that are subject to PSB regulation has and will become more of a challenge. Flexibility for small incumbent telephone companies may be especially important as competitive choice grows in independent territories. Although independent companies have historically faced fewer competitors than Verizon, competition through alternative facilities such as cable or wireless could increase rapidly over the near term. Introduction of competitive alternatives that were extensively available to a wide range of customers in independent territories would change the level of market power historically enjoyed by these companies. These companies will need to adapt to new circumstances. The chance that increased competition for these companies could come along sooner rather than later makes it a priority to implement an alternative regulatory framework for small incumbent companies for the transition to greater local competition. Alternative regulation plans, which the PSB is permitted to apply to individual companies, may offer the independents the flexibility they seek, while assuring that the rates for traditional services remain reasonable and that reliability, service quality and the ability of other carriers to offer services

in competition with the independents are not compromised. In addition, the legislature in 2004 increased the attractiveness of alternative regulation for companies with fewer than 10% of Vermont's access lines. Amendments to Title 30 provide the authority to the PSB to use an expedited process for establishing alternative regulation plans for small companies, and to refrain from conducting cost-of-service, rate base or rate-of-return analyses as a precondition to alternative regulation.[1]

Over the period of the plan, the PSB and PSD will need to evaluate the effectiveness of alternative regulation plans that have been implemented. At the expiration of an alternative regulation plan it is reasonable to assess how well the plan has worked over its life. Key issues may include:

- Whether the current service quality benchmarks are set at levels consistent with industry norms and reasonable customer expectations,
- The long-run adequacy of network maintenance and capital replacement,
- The extent to which the company used the flexibility accorded it under the legacy plan to the benefit of its customers,
- The extent to which the value offered (rates, service quality, and service availability) to Vermont customers by the company has advanced, lagged or kept apace with corresponding value offered by the company to customers in other states or with other comparable companies, and
- In what other ways the plan functioned or did not function as expected.

It is important that the PSB, PSD, and regulated companies continue to build on the experience that Vermont has gained with alternative regulation.

Policies

- Alternative regulation plans should be consistent with the state of competition in the telecommunications markets in which the subject company operates.
- Network modernization and investment expectations should be an important element of any alternative regulation plan over the next five years. Alternative regulation plans should use milestones for marking and evaluating the company's ongoing progress toward transformation of telecommunications networks consistent with the infrastructure and service goals and specific desired improvements contained in this plan. (See especially Section 6 and the subsection on "Network Infrastructure Standards" below.)
- Service quality plans should remain a feature of alternative regulation plans. Less emphasis should be placed on service quality measures that are subject broadly to competition. Continued or greater emphasis should be placed on measures related to facilities and services the incumbent controls, for which there are few meaningful competitive alternatives; or which are essential for public safety and economic activity.
    - Wholesale service quality measures should be a part of an alternative regulation service quality plan for companies that provide regulated wholesale service. (See also the subsection, "Wholesale Service Quality," below.)

- Alternative regulation plans should ensure that areas of poor service quality performance, when they occur, will be remedied and not only penalized.

- In exchange for commitments that will deliver value to the state, additional pricing flexibility may be extended to local dial tone rates in areas where sufficient competition exists, but with safeguards to prevent excessive price increases, should any price increases occur.
- Alternative regulation plans should be responsive to consumer expectations and interests in purchasing packages that combine regulated and non-regulated services.
- Alternative regulation plans for smaller independent companies need not contain the same level of complexity as a large company alternative regulation plan, but should be tailored to the circumstances of the company.

Strategies/Action Plans

- The PSB should investigate a successor plan to the current Verizon alternative regulation plan, instead of extending the current plan for any great length of time, so as to provide the opportunity to incorporate new objectives, policies and experience.
- Independent telephone companies and state regulators should begin work in the short term to develop an alternative regulatory framework for small incumbents. Such a framework should provide companies with flexibility to react to competition, technological change, and other factors as they arise.

SETTING A FRAMEWORK FOR COMPETITION

Telecommunications competition in Vermont has begun to take hold in many markets, but it still is in a relatively early stage overall. Through Telcove, Vermont has a major alternative fiber network that extends through all regions of the state. Companies like Lightship and SoVerNet have combined wholesale transport and loop facilities with their own voice and packet switching equipment. National companies like MCI have taken advantage of the complete Unbundled Network Element (UNE) platform of wholesale Verizon elements to capture a small but significant segment of the local market. Wireless companies like Unicel have begun to offer wireless voice packages with pricing competitive with landline service for some customers. Cable and telephone companies already compete for mass-market data customers. In the near future, it is highly likely that cable companies will introduce voice services in Vermont as they have done elsewhere. The developing competition from wireless voice services and the coming telephone service over cable are of special interest because they both are delivered to the end user without buying wholesale facilities from Verizon.

Yet it would be a mistake to characterize the current state of affairs as a fully developed competitive market. CLEC and cable facilities lack the ubiquity of the traditional telephone network. Even competitors with their own switching, transport, and local loop facilities (such as Telcove) must rely on Verizon loops to reach certain individual customers. Wireless quality of service often does not yet equal that of landlines and in many locations coverage is lacking. Incumbent telephone company facilities and services are still in many ways the "glue" that

binds together the many new and legacy telecommunications networks that exist side-by-side. This means that incumbents often continue to provide essential services and bottleneck facilities. Competitive alternatives are increasingly available for retail services, but the strength of those alternatives often depends heavily on the ability of competitors to buy at wholesale key elements and services from other carriers.

Competition can pressure companies to increase efficiency, respond creatively to consumer demand, introduce and market new services, price services attractively, and possibly expand the geographic reach of their service in response to other providers coming to their own territory. State regulators have a number of roles to play to support and encourage the benefits competition can bring to consumers. Going forward, wholesale markets warrant a greater proportion of state regulators' energy. Attention to wholesale service quality and wholesale terms and prices, in addition to facilities-based competition, will enable more retail competitive alternatives. Encouraging, and if necessary establishing, simple, fair, flexible, and predictable interconnection will allow competitors greater freedom to innovate. The state will have a role in promoting informed competition and enforcing fair trade practices, buffering the most vulnerable, and acting to preserve public confidence in the telecommunications network and in competition.

CONSUMER PROTECTION

Changes in the telecommunications marketplace have changed the nature of consumer protection in telecommunications. At one time regulators fixed rates, choices were few, and disputes often focused on connection or disconnection of retail service by a single provider. No longer. Competition has substantially increased and changed the nature of complaints lodged by consumers at the PSD. Some complaint themes remain the same as in a monopoly service market—complaints about delays in provisioning service, for example. The most competitive market segment—long distance—now produces the greatest volume of complaints. These complaints largely deal with problems that are most likely to occur as competition develops—billing errors, misrepresentation of rates, and unauthorized changes in service. In addition, the advent of competition in the market for local residential telephone service is producing a new generation of complaints. Those complaints principally involve carriers new to Vermont failing to abide by the most basic consumer protection rules. Most providers of local phone service are operating nationally, and either disregard state-specific requirements or experience difficulties customizing their systems and networks to conform to state-specific requirements. Wholesale transactions can also lead to situations that produce consumer complaints. With increased frequency, complaints about local or long distance service reflect provisioning or communication errors between a consumer's retail provider and the underlying company that provides service on a wholesale basis.

Competition provides consumers with the power of choice when shopping for telecommunications service—if they don't like the terms or the service provided by a company, they may leave for an alternative. Consumers that have true choices do not require the same kinds of protections against high prices, poor customer service, or loss of service from a particular provider. In a competitive

marketplace, consumers must be protected from those practices that erode or impede the consumer's ability to choose in an informed way. Customers must be able to decide and control which carrier will serve them. Consumers must be informed, in ways they can understand, about how much their service will cost, and they must not be misled about the price and terms of service. Services must be billed accurately and at the rates consumers were offered. These consumer protection principles protect not only consumers but also the bulk of companies that are prepared to give consumers a square deal, as well as public confidence in competition itself. Furthermore, telecommunications service remains essential to participation in society and the conduct of business, and for public safety. Consumers must have sufficient protection against unreasonable loss of service from all providers; competition should make it easier for consumers to obtain service, not less so.

Competition does not mean the end of consumer protections, but instead requires a different focus. The PSB's rules on disconnections and deposits for telecommunications service are badly out of date, having last been revised in 1990 for deposits and residential disconnections and in 1983 for non-residential disconnections—before any meaningful competition in telecommunications.[2] These rules provide consumers with extensive protections against loss of service from individual providers, even in those situations when the consumer has many other providers from which to choose. In 1999, the PSB adopted in Docket 5903, a "consumer bill of rights." (See sidebar, "Consumer Bill of Rights.") While many of these principles are very applicable to a competitive marketplace, they remain separate from the PSB's rules. There exists a wealth of transferable experience from the application of state and federal consumer fraud laws as enforced over the years by such agencies as the Federal Trade Commission and the Attorney General's office that could be used in crafting consumer protections with broad but specific and well-understood meaning.

In fact, to the extent that services not regulated by the PSB come to compete with services regulated by the PSB, it will be important to harmonize the consumer protections of the PSB and the consumer protections overseen by the Attorney General. Many (although not all) of the consumer protections that a competitive telecommunications market requires are substantially similar to those protections any competitive market requires. Indeed, the Vermont Attorney General can and has pursued actions and settlements against telecommunications companies for alleged violations of Vermont's fair trade laws. (Although there are some elements of Vermont's

Consumer Bill of Rights

Public Service Board Final Order July 2, 1999, docket 5903

- Consumers shall have the right to know and control what they are buying.
- Consumers shall have the right to know from whom they are buying.
- Consumers shall have the right to know the full price of the goods and services that they are purchasing.
- Consumers shall have the right to reasonable payment terms.
- Consumers shall have the right to fair treatment by all providers.
- Consumers shall have the right to impartial resolution of disputes.
- Consumers shall have the right to reasonable compensation for poor service quality.
- Consumers shall have the right of access to basic local exchange service as long as basic local exchange service charges are paid, regardless of whether they have paid any charges for non-basic local exchange services.
- Consumers shall have the right to be free of improper discrimination in prices, terms, conditions, or offers.
- Consumers shall have the right to privacy by controlling the release of information about themselves and their calling patterns and by controlling unreasonable intrusions upon their privacy.
- Consumers shall have the right to join with other consumers for mutual benefit.

generic consumer protection laws from which companies regulated by the PSB are currently exempt.) The Attorney General has authority to address consumer fraud and related problems and to elaborate on fair trade laws with rules for specific industries, even for otherwise unregulated companies. The Attorney General also has a history of pursuing multi-state settlements in cooperation with other Attorneys General, and these multi-state agreements may often be appropriate in an industry with companies operating in multiple states. For all of these reasons, shifting greater emphasis to the Attorney General for consumer protection in competitive telecommunications markets may be appropriate. Nevertheless, simply removing responsibility for telecommunications consumer protection away from the PSB and the PSD's Consumer Affairs and Public Information Division (CAPI) would risk losing some important benefits. State utility regulators have special expertise and experience in dealing with the telecommunications industry and its technology. CAPI employs a professional staff to receive complaints about essential services like telecommunications and to work with consumers and companies to see those complaints resolved; the Attorney General's Consumer Assistance Program (CAP) relies heavily on part-time college students to take complaints and consumers receive less active assistance with their individual complaints. CAPI also has provided an important link for state regulators to consumers' experiences. It may very well be more efficient and fair to reduce the extent to which state consumer protections overseen by the Attorney General and state utility regulators overlap, but it should be done in such a way that maintains key advantages found in the current system.

Finally, consumer protections are of limited value without effective enforcement. Currently, the Department's Consumer Affairs and Public Information Division (CAPI) handles and resolves the vast majority of consumer complaints informally and without the authority of the PSB. CAPI has no authority to formally enforce PSB rules and orders dealing with harm done to consumers. Consumers who complain are helped while practices that led to the complaint are not necessarily fixed. When necessary, enforcement actions are brought before the PSB. These proceedings are handled much like other cases before the PSB, and involve considerable expenditures of time and other resources. As a result, only a fraction of violations of PSB rules or orders that established consumer protections are ever brought before the PSB for resolution and penalties. While in these cases significant penalties often are sought, selective enforcement, as necessitated by the time-consuming process, may not deter purposeful violations or encourage diligent adherence to established rules and policies. There is a role for a "small claims" type of proceeding where companies who have a less egregious pattern of violations can be brought quickly to account, but where large penalties are not necessarily at stake. Such a forum would allow state authorities to warn and give authoritative guidance on the application of consumer protection rules and regulations while not allowing harmful practices to fester and be perpetuated.

Policies

- Consumer protections for telephone service should be reformed to better reflect the emerging role of competitive markets.

Strategies/Action Plans

- A revision of the disconnection and deposit rules for telephone service should be a high priority for the PSD and the PSB.
  - The PSB's rules should allow companies to use alternative measures of creditworthiness (other than past payment of utility bills) that are commonly used among a wide variety of businesses.
  - The PSB's rules should allow companies to use means of assuring payment for customers with poor credit other than deposits, such as prepaid service.
  - The PSB's rules should allow companies a less demanding disconnection notice and notice period for those services for which there is competitive choice. Consumers should continue to have strong protections against disconnection from companies receiving universal service support.
  - Consistent with current PSB policies, consumers should not lose access to basic local service for failure to pay charges for other services.
- The PSB's rules should be amended to include generic consumer protections providing for rate disclosure, proscribing unfair billing practices, unfair or deceptive marketing practices, and other unfair trade practices.
- The PSD should propose streamlined administrative procedures for the rapid adjudication of consumer protection cases where the possible penalties are relatively small.
- The PSB should bar companies from refusing to port numbers for failure to pay legitimately disputed charges.
- State policymakers should collaboratively examine ways to achieve greater consolidation of consumer protection roles now performed by the PSD, the PSB, and Attorney General in competitive telecommunications markets while still preserving appropriate consumer protections. Any reforms should preserve the following features:
  - A professional staff that receives and works to resolve Vermont consumers' complaints;
  - Staff with expertise in telecommunications technology and markets; and
  - A flow of information about consumer experiences to state telecommunications regulators.

RETAIL SERVICE QUALITY

In Docket 5903, the PSB established a set of generic service quality standards that apply to all local service providers in addition to establishing consumer protection principles.[3] The purpose of these standards was to establish minimum performance levels in areas such as installation and repair, reliability, and companies' handling of customer requests, inquiries, and complaints. These standards, which were reached through a stipulation with the incumbent local exchange companies, are generally weak and in some cases should be updated to reflect intervening and on-going changes in technology and the marketplace.

During the years they have been in place, the standards have proven valuable for several purposes. They keep companies focused on basic aspects of network integrity and customer service, and they enable the public and regulators to

evaluate the performance of companies over time and in relation to one another. These benefits are especially important where companies face incentives to cut costs. As the number of companies operating in the state grows the PSB and the PSD will face an increasing challenge to collect and make good use of service quality data. In addition, where consumers have a true choice of providers the purpose of monitoring and reporting service quality results shifts from being exclusively a regulatory tool, and its role as a customer information tool becomes more important.

Policies

- In a competitive market service quality standards and reporting requirements should apply to companies that have dominant market positions. Such standards and reporting requirements should, likewise, apply to nondominant companies when there is a significant possibility that consumers are receiving poor quality service and cannot readily obtain adequate quality service from another provider. Companies that receive universal service funding should have a special responsibility to meet or exceed service quality standards.

Strategies/Action Plans

- The PSB should modify the existing generic service quality standards to keep pace with changes in reasonable consumer expectations, technology, the marketplace, and service quality benchmarks widely accepted among other jurisdictions.
- The PSB should exempt nondominant carriers from mandatory reporting on service quality metrics except for Eligible Telecommunications Carriers (ETCs)[4] and except when it determines that there is a cause to believe a carrier has a pattern of delivering poor service.
  - The PSD and PSB should encourage voluntary reporting of service quality metrics by nondominant carriers. The PSD should publish comparative ratings on reported service quality measurements for consumers, including a list of companies who choose not to report.

Standards keep companies focused on basic aspects of network integrity and customer service.

WHOLESALE SERVICE QUALITY

Nearly all competitive alternatives to Verizon's local service are provided by CLECs that resell Verizon's service or lease some or all of the necessary facilities from Verizon. The sustainability of local phone service competition in Vermont, for at least the near future, is dependent on the quality of Verizon's wholesale service. CLECs must receive good quality wholesale service from Verizon in order to provide good quality retail service to their customers. Moreover, those CLECs would be placed at an unreasonable competitive disadvantage if Verizon provides better service to itself than to its competitors. Verizon has operated under a wholesale service quality plan to which it consented as part of its approval to enter the interstate long distance market. The "Performance Assurance Plan" is modeled on a similar plan applicable to Verizon in New York. A number of factors recommend this approach, including avoiding the administrative burden of creating and tracking performance according to a framework unique to Vermont, and the fact that many potential competitors operate in multiple states. The PSB recently closed an investigation into whether it should

impose a distinct Vermont wholesale service quality plan on Verizon. In this docket, SoVerNet presented evidence that its ability to provide quality service to customers had been substantially impaired by poor wholesale service quality from Verizon. At the same time, Verizon had not violated its wholesale service quality plan. This points out a key weakness in the plan. The wholesale service quality plan measures the service Verizon gives CLECs against the service it provides itself; that is, for most performance benchmarks, the metrics measure the amount of difference between levels of service quality for Verizon's retail and its wholesale services. At the time, Verizon had failed in a number of key measures for its separate retail service quality plan, which is part of its alternative regulation plan. A service quality plan should promote consistently high quality of service instead of just merely consistent service, good or bad. In closing the wholesale service quality investigation, the PSB reminded parties that closure did not foreclose the opportunity to request the PSB investigate specific instances in which they believe Verizon's wholesale service is inadequate and correctly noted that it may be appropriate to examine wholesale service quality issues in the context of its forthcoming review of a successor to Verizon's Incentive Regulation Plan.

Policies

- For ease of administration, the PSB should look to use the wholesale service quality plans found in other large states or groups of states as models;
- Wholesale service quality standards should have absolute service quality floors, not merely relative ones.

Good quality wholesale service is needed for good quality retail service by a competitor.

Strategies/Action Plans

- Measures of wholesale service quality should be incorporated into future alternative regulation plans where the company offers regulated wholesale services.

OPEN NETWORKS/UNBUNDLING

It is unrealistic to expect multiple ubiquitous, high-quality physical telecommunications networks in the near or even medium term. Yet even if there are a limited number of physical networks in the state, if those networks are open, it is possible for a greater number of service providers to use those networks to innovate and provide Vermonters with a range of telecommunications services. This "openness" is an important value and should remain a part of telecommunications in Vermont. Economical access to portions of the network in a manner that provides flexibility to customers is important not only for competition but to create room for new or innovative applications of telecommunications technology by retail as well as wholesale customers. The biggest questions are how far-reaching the requirements for open networks should be and what prices incumbents should be allowed to charge. Past and present examples of "openness" include: the freedom of consumers to attach their own phones, fax machines, and modems to telephone networks; "equal access" to a choice of long distance companies; and the ability to use broadband data pipes for the whole range of applications supported by TCP/IP, including e-mail, web browsing, and voice and video communication, without restrictions on content; and the freedom of carriers to turn raw transport or "dark fiber" on carrier-neutral networks into

higher-level services. Maintaining "openness" may involve a greater or lesser level of regulatory intervention, but it is essential that Vermonters have substantial choices in how they put their telecommunications services to work for them.

The most basic level of openness is the right of customers to use communications services to engage in communication of their own choosing. In a broadband Internet world, this means the ability to send e-mail, access web sites, send and receive video and audio content, and use voice and other communications applications that can be transported over IP, all at the discretion of the customer, within the technical limits of the service he or she has purchased. Telecommunications service providers are consistently identified under the law as "common carriers," and afford their customers this kind of freedom to use the services they purchase to determine what communication goes over the services they buy. In contrast, companies that are not telecommunications companies under the law, like cable and satellite TV providers also often influence the content communicated or carried by their service by selecting the channels carried by the service.

Internet service providers have not traditionally been classified as telecommunications service providers, but "information service" providers. Information service providers can limit customer's access to or use of communication. In practice, this is not a significant risk with Internet access services because consumers have been able to use their telecommunications services (such as telephone calls or dedicated data circuits) to access a large selection of Internet service providers. With consumer broadband services, the situation is often different. The communications link to the consumer (such as a DSL copper pair or a the cable modem access) is usually bundled with the Internet service, and there are often only one or a very small number of ISPs the customer can choose from, either as a matter of company policy (such as with most cable companies), or because few ISPs elect to provide Internet service over broadband transport provided by an unaffiliated company (such as is usually the case with DSL). Because these broadband services mix transport with what has traditionally been considered an "information service," the Federal Communications Commission (FCC) and the federal courts have been divided in their opinions about how these services should be classified. The PSD and PSB have opposed FCC efforts to classify cable modem Internet access as exclusively an "information service," with no "telecommunications service" component, and the matter is still in the courts as of this writing. Recognizing the telecommunications service component of broadband Internet access is important for protecting consumers' ability to freely access content and applications over the Internet. Recognizing the telecommunications service component of broadband Internet access need not lead automatically to large amounts of regulation; there is still an important role for forbearance. However, clarity that these services should remain open to users' communication choices will benefit consumers and help sustain competition the in the applications and services that ride on the broadband communications platform.

If companies have access to basic elements and services, a much larger choice of services, applications, and service providers become possible.

One way that telecommunications companies gain access to pieces of the telecommunications network today is through the state and federal policy of unbundling. Unbundling is a cornerstone tool in current federal-state oversight of the transition from monopoly to competition in local telecommunications markets. It has meant allowing competitors to buy parts and pieces of an incum-

bent's network (especially those of the Regional Bell Operating Companies, such as Verizon) at wholesale rates in order to offer service. Wholesale pricing is dominated by federal policy. The FCC has directed states to use the Total Element Long-Run Incremental Pricing (TELRIC) method for setting wholesale unbundled prices. This method looks forward at what it should cost to build a network anew instead of backwards at incumbents' embedded costs for building the networks they have in place. By applying this method, state commissions set rates on a state-by-state basis. The range of services available for unbundling is also heavily influenced by federal policy. Unbundling rules have been a source of controversy. The Regional Bell Operating Companies (including Verizon), on whom unbundling requirements primarily fall, have supported a variety of initiatives in Congress and before the FCC to reduce or eliminate unbundling requirements. In its 2003 "Triennial Review" decision, the FCC affirmed unbundling while making several changes to its rules regarding unbundling. (See the "The Unbundling Debate" in Part 1, "Telecommunications Trends.") An appeals court overturned that decision, and the future of the rules is uncertain. While the overturning of the FCC's Triennial Review decision on appeal leaves uncertain exactly what specific decisions Vermont will need to make on UNEs in the future, it is worth considering how technology and the development of facilities competition in Vermont could influence the importance of UNEs over time. For example, the trends in the technology of switching, in which advances in computing are offering cheaper switching options from vendors, suggest that mandatory unbundled switching may not be needed as long as other elements, such as the local loop or transport elements.

As a general matter, the availability of open networks and unbundled services and elements on a wholesale basis is important in Vermont, regardless of whether these are supplied by Verizon or other companies. It is not realistic to expect a large number of facilities-based carriers to build out Vermont. Yet it is possible for Vermonters to have a much larger choice of services, applications, and service providers—if companies have access to a relatively small number of basic elements and services, and those elements and services are available on reasonable terms.

Table 8.1:
Verizon wholesale rates vs. Verizon retail rates

	Residential			Business		
	Zone 1	*Zone 2*	*Zone 3*	*Zone 1*	*Zone 2*	*Zone 3*
Total wholesale price for unbundled loop, port, and switching	$12.75	$13.38	$26.66	$12.75	$13.38	$26.66
Average Verizon retail charges for local service (assumes 500 minutes of peak calling, and 500 minutes of off-peak calling)	$32.10	$32.10	$32.10	$48.39	$48.39	$48.39
Wholesale price as a percentage of retail charges	39.7%	41.7%	83.1%	26.3%	27.7%	55.1%

Sources: National Regulatory Research Institute, "A survey of unbundled network element prices in the United States." July 2003. Supplemented by personal communication August 14, 2003, by author Billy Jack Gregg to Christopher Campbell.

Policies

- To allow Vermonters continued access to a broad range of service offerings and innovations in telecommunications, it is important to have common carriers who provide wholesale and retail customers with an open network, allowing them flexibility to take services and elements and transform them into value-added services.
- The availability of wholesale unbundled services and network elements on reasonable terms and conditions is important to sustaining a robust telecommunications marketplace in Vermont.
  - Unbundled access to loops and many forms of transport are especially important to enable competition over the near to mid term.
  - Unbundled access by competitors to incumbent dark fiber transport is increasingly important.
  - The importance of unbundled access to switching is being eroded by technological trends such as the availability of softswitches. However, any elimination of unbundled switching elements in Vermont must be based on further evidence. Competitors should not plan to rely indefinitely on long-term access to mandated unbundled switching from Verizon.

Strategies/Action Plans

- The PSD and PSB should continue to advocate for federal recognition that services delivering broadband Internet access to customer premises, such as cable modem service and DSL service, contain a "telecommunications service" component, thereby recognizing customers' right to have control of the communication for which they use the service and the content that they access.

BUNDLING

While the term "unbundling" occurs frequently in discussion of wholesale markets, the terms "bundling" or "bundles" are found in discussions of retail marketing strategies. Essentially, companies that offer multiple services to consumers try to get customers to buy groups or "bundles" of services, often by offering a lower price on the whole bundle than the sum of the prices of the individual services. As communications companies enter each others' legacy lines of business, bundles are becoming more common. Examples of bundles include; bundles of telephone, high-speed Internet access, and cable TV or other video programming; bundles of local and long distance service; or bundles of local and wireless telephone service. There are a number of reasons why a company may find it desirable to offer customers packages or bundles. When customers buy more services, companies may often be able to spread out certain kinds of costs to serve each customer, like infrastructure, marketing, and customer service costs, over a larger revenue base. Selling a customer more services at better combined prices is often thought to increase customer "stickiness," the likelihood that a customer will stay with a company and not leave for a competitor's service. Even if the profit margin is lower on each service in a bundle than on individually priced services, bundles may result in higher overall income for the company that offers them.

Regulators have traditionally been wary of bundles that combine regulated and unregulated services. The concern has been that this provided regulated companies a way to offer some customers a lower price on a regulated service as an inducement to those customers to buy an unregulated service. This could result in unfair competition in the unregulated market and a revenue shortfall in the regulated market that would need to be made up by other captive customers. New competitors are now poised to offer bundles of service that include even local telephone service. To compete with these bundles, telephone companies that have been traditionally regulated now need the ability to respond with their own bundles of regulated and non-regulated services. In 2004, the legislature amended Title 30 to allow the PSB to review and approve tariffs that conditioned the purchase of regulated services on unregulated or jurisdictionally interstate services, provided that revenue was reasonably allocated between services.[5] This flexibility opens the door to a more permissive stance by the PSD and PSB on bundling.

Strategies/Action Plans

- The PSB and PSD should recognize that some bundling of services regulated by the state with services not regulated by the state is necessary for incumbent carriers to compete over time with new entrants, many of whom are subject to less state regulation.

TRAFFIC EXCHANGE/INTERCONNECTION

If end users are to communicate with any other user, regardless of who provides their service, telecommunications traffic must be exchanged predictably and reliably among carriers, including carriers that compete with one another. A network of many providers' networks requires that traffic flow among them. When one compares the voice telephone network to other modes of communication that lack interconnection—like instant messaging—a great strength of the telephone network is plain; on the telephone network, users have the ability to call customers of independent telephone companies, Verizon, new competitors, wireless companies and more. We take it so much for granted it is hardly noticed.

While all local exchange carriers are required by the Telecommunications Act of 1996 to exchange traffic with other Local Exchange Carriers (LECs), directly or indirectly, in practice this has taken one predominant form in Vermont: every carrier is interconnected for traffic exchange with Verizon. This indirect traffic exchange can be useful, especially when the volume of traffic between two third parties would otherwise be small. Yet, it would be unreasonable to require Verizon to act as the middleman without compensation, as they have in some cases in the past. Verizon's customers would ultimately bear costs incurred by Verizon to provide this transit service. In the future, a greater diversity of arrangements could be desirable, including a greater amount of direct traffic exchange between carriers.

While interconnection of networks for exchange of voice traffic is commonplace, interconnection of carriers' data communications networks is less common. The inefficiencies that result from this lack of data network interconnection is perhaps most significant in cases where a business or institution has sites located in both the territory served by Verizon and by independent telephone companies.

For instance, a voice telephone business customer with locations in both Verizon and independent telephone company territories may obtain telephone service from both sets of companies without concern that employees will be able to call seamlessly from one site to the other. A business connecting multiple sites with frame relay service may be in a different situation. Such a business probably will not be able to order frame relay from each company and expect them to interconnect. Instead, it will most likely need to obtain frame relay service from one company, which will, in turn, connect the sites in the other company's territory to its own network using more expensive dedicated circuits. Providing direct connections between different company's data systems would allow each to more efficiently and economically serve customers.

Policies

- Traffic exchange between data communications networks (such as frame relay, ATM, or Ethernet networks) of different carriers is supported and encouraged.
- Verizon and other carriers providing transport of local traffic between two third-party LECs should receive compensation, preferably negotiated privately between the parties. Direct interconnection is encouraged as an alternative.
- Independent telephone companies should exchange traffic with competitors offering service to their exchanges.
- Independent telephone companies, wireless companies, and CLECs with larger presences in Vermont should interconnect directly for the purpose of exchanging traffic.

WIRELESS TELEPHONE REGULATION

As the services offered by wireless companies mature and more people use and rely on wireless telephone services, it is reasonable to re-examine how wireless service providers fit into the overall framework for a competitive telecommunications marketplace. Wireless companies that provide telecommunications service are deemed to be telecommunications companies under Vermont law, and therefore fall within the jurisdiction of the PSB. Federal law restricts states' authority to regulate rates and prevent market entry, while leaving other aspects of regulation to each state's discretion. Regardless of authority, wireless service in Vermont has in practice been very lightly regulated (except with regard to siting facilities). For instance, in lieu of the Certificate of Public Good and tariff requirements applicable to other telecommunications companies, the PSB requires wireless companies only to register with it and file standard service contracts for informational purposes only. The service quality standards that the PSB has applied to wireline carriers it has not imposed on wireless carriers, nor do the policies established by the PSB in Docket 5903, the generic investigation into consumer protection for telephone consumers, apply to wireless carriers. The maturation of the wireless service market, and the increasing substitution of wireless service for wireline services argue for a convergence of wireless and wireline telecommunications regulation. This convergence should be accomplished predominantly by moving nondominant wireline companies in the direction of the current regulatory framework established for wireless, i.e. toward lighter regulation, rather than by increasing the regulation on wireless

companies. Somewhat higher levels of regulatory attention should be expected for wireless companies that voluntarily seek universal service funding, to make sure that the use of the funding is consistent with the public policy objectives of universal service programs. (This does not include those subjects that are preempted by federal law, such as rates.)

Policies

- The PSB should forebear from regulations that apply only to wireless companies when allowed to by law.
- Wireless companies should not necessarily be exempt from future generic telecommunications consumer protection rules that have been designed for a competitive marketplace and apply to all nondominant telecommunications carriers (see also subsection on "Nondominant Regulation," above), other than those rules that would be preempted by federal law.

VOICE OVER INTERNET PROTOCOL

Voice over Internet Protocol (VoIP) presents an exciting opportunity to lower the price of voice service, offer new features, and bring new competition. It also presents challenges to legacy regulatory models. There are different types of VoIP. A more complete discussion about these types is found in Section 1, "Telecommunications Trends." The discussion here will deal primarily with two types of voice-over-IP that use telephone numbers and interact with the Public Switched Telephone Network (PSTN). For convenience, these are referred to herein as "type 1" and "type 2" VoIP

- Type 1 voice-over-IP encompasses what is often known as "computer-to-phone" VoIP. In these instances, the service provider provides the voice service to the customer in a data format. The service provider also provides a gateway to the PSTN that will allow the customer to communicate with people who have conventional phones. Because the service provider brings the service to the customer in a packet data format, the customer must either use a computer or IP phone to communicate or use some form of adapter device that will convert the data communication into a form usable by conventional telephone equipment. IP networks used to deliver type 1 services to customers will support not only voice services, but also other data or even video applications.
- Type 2 voice-over-IP encompasses instances where the Internet Protocol is used by a carrier at some point in its network, but which presents itself functionally to the customer as a conventional telephone service requiring only conventional telephone customer premise equipment. Sometimes this is known as "phone-to-phone" VoIP. With type 2 services, it is virtually impossible for the customer to know that the service uses IP, unless he or she is told.

It is in the interest of Vermonters to allow them ready access to the wide variety of voice-over-Internet services.

The regulatory status of nearly all forms of VoIP is in flux, and the FCC released a notice of proposed rulemaking on the subject in March 2004.[6] FCC actions may restrict the PSB's discretion, or outright preempt its jurisdiction in this realm. To the extent that any authority is reserved for the PSB, Vermont should not attempt to regulate voice-over-IP in a significantly different way from most

Telecommunications service under Vermont law

The issue of how to properly classify voice-over-IP under state law contains echoes of a previous issue that is in suspension—the classification of cable modem service. Under Vermont law, "'Telecommunications service' means "the transmission of any interactive two-way electromagnetic communications, including voice, image, data and information. Transmission of electromagnetic communications includes the use of any media such as wires, cables, television cables, microwaves, radio waves, light waves or any combination of those or similar media." In its Order in the Docket 6101 Adelphia refranchising case, the PSB tentatively concluded Internet over cable was a telecommunications service, and under its jurisdiction. Vermont's statutory definition of telecommunications does contain a data exemption, created by Vermont's legislature in 1987, based on the Computer II federal regulation of that era that sought to protect and encourage the growth of electronic services, such as bulletin board and subscription data services. Noting the similarity of ISP services such as email and data transmission to those services protected by the Vermont definition's data exemption, the PSB concluded that "the provision of Internet service by an Internet service provider, when the manipulation of data is joined with the transmission of data, is not "telecommunications service" under 30 V.S.A. § 203(5)." However, it went on to say:

> Adelphia, however, is more than an ISP. Adelphia also provides the physical facilities for two-way transfer of Internet data. In the 1980's, subscription data services and electronic bulletin board services did not also physically transport their customers' data. We conclude, therefore, that the physical transport of Internet data is not protected by the data exemption. Because Power Link is two-way communications electromagnetic communications, and because it is not covered by the data exemption, we tentatively conclude that Power Link, and other cable television systems that provide Internet services, are providing "telecommunications service" under Vermont law.

The fact that Vermont law regarding what kinds of services are considered "telecommunications" is similar to, but slightly different than federal law is sometimes missed in the debate over whether or not to subject a service to the jurisdiction of the PSB. While "telecommunications" is but one word, it can have somewhat different legal meanings in Vermont and a federal context. At the federal level, the classification of cable modem service is in legal limbo. The FCC has ruled it is an "information service," while the Ninth Circuit Court of Appeals has ruled it is a "telecommunications service." The question is on further appeal. After its tentative conclusion in Docket 6101, the PSB had discontinued further investigation into the question of state-law classification, and supported the argument at the federal level that the service was a "telecommunications service." The PSB thus far has not attempted to enforce its tentative conclusion in Docket 6101.

Until this issue is fully resolved, it is nevertheless possible to narrow the controversy. Steps to change and loosen the regulation on nondominant telecommunications carriers will have the effect of bringing the practical regulatory treatment of nondominant telecommunications service providers and information service providers closer together.

of the rest of the country, as this is likely to limit market entry and choice to Vermont consumers. Nevertheless, Vermont policy-makers will need to face this issue and should participate in that national discussion; the analysis and preliminary conclusions in this plan are intended to inform and guide their considerations.

To allow Vermonters ready access to the wide variety of type 1 providers coming on line, it appears best to forbear from subjecting these services to PSB regulation to encourage market entry by providers in Vermont. Type 1 services effectively change the voice service from its position as the primary telecommunications service to a position as an application riding on top of a data telecommunications service. The number of type 1 service providers available on the Internet is growing rapidly, and there appear to be relatively low barriers to entry in this market. Consumers with standard IP telephony equipment have access to many alternatives and can set up a new service relatively rapidly. Pricing for this service is relatively low and is likely to be driven even lower as the market matures. Finally, as mentioned previously, type 1 service requires an underlying broadband connection, which is likely to be more expensive and for which there are likely to be many fewer competitive choices than the type 1 service itself. The loss of that underlying service would present a much greater problem to a home or business trying to maintain its communications capability than would the loss of the type 1 Internet telephony service. Limiting state regulation of this service will encourage the development of the nascent market for this new service.

The PSB has substantial authority under 30 V.S.A. § 227c to modify, reduce or suspend the otherwise

applicable requirements for nondominant providers of telecommunications service relating to regulation of rates and other terms and conditions, as well as various corporate and financial transactions. However, the PSB has less discretion under state law regarding which companies will be subject to its jurisdiction. The section of Title 30 that defines the telecommunications companies subject to the PSB's jurisdiction, 30 V.S.A. § 203(5) includes a data exemption created by Vermont's legislature in 1987, based on the "Computer II" federal regulation of that era that sought to protect and encourage the growth of electronic services, such as bulletin board and subscription data services. The exemption only extends to "nonvoice" services. (See sidebar, "Telecommunications service under Vermont law.") While at one point the use of voice as a trigger was reasonable, today it raises serious questions. Does even voice chat over Internet instant messaging systems constitute service subject to PSB jurisdiction? The "nonvoice" exemption does not appear to depend on whether or not a voice service uses telephone numbers, and seems to imply that even "computer-to-computer" VoIP applications that do not interact with the PSTN could fall under PSB oversight according to state law.

Even if type 1 service is not regulated by the PSB, there will still remain a number of important public-policy issues that type 1 service raises. This is especially true if type 1 service is offered as a mainstream alternative by cable and traditional telephone companies, and it attracts significant numbers of consumers who begin to use the service in place of legacy telephone services. Three types of issues that arise are issues of consumer protection, intercarrier issues, and "social obligations" such as support for universal service and 9-1-1. The paragraphs immediately below discuss the latter two issues, while the subsection on "Consumer Protection," above, discusses this plan's approach to consumer protection in competitive marketplaces.

Intercarrier issues arise because the rights and privileges of telephone companies as they relate to other telephone companies (for example, the right to interconnect with other telephone companies, the ability to obtain blocks of telephone numbers from numbering administrators, the right to reciprocal compensation, etc.) often hinge on the status of the companies as certified telecommunications companies. To address this, it should be clear that the PSB will only enforce those rights and privileges for companies that hold certificates of public good to provide telecommunications service. The use of CPGs is a convenient signal to participants in the telecommunications industry regarding who is entitled to claim those rights and privileges. To this end, it may in fact be desirable for some type 1 providers to voluntarily seek out or maintain at least nondominant regulation by the PSB. Other type 1 companies may simply elect to work with partners who are telephone companies certified in Vermont and who sell the type 1 provider access to the PSTN. Specific discussions of local number portability and virtual number issues as they relate to type 1 services are in the subsection below on numbering.

The current telephone system provides support for a limited number of key public benefits. These include access to E 9-1-1 emergency services and universal service programs that help all members of society obtain essential communications. Erosion of these public benefits due to a migration of users from legacy telephony to VoIP would not be in the public interest. Issues

affecting E 9-1-1 are discussed in the subsection, "E 9-1-1," below. In addition, the discussion of how to apply universal service support on a going forward basis, found in Section 5, is applicable to these companies. In essence, it should be possible to separate the obligation of VoIP providers who interact with the PSTN to support these public benefits from the issue of imposing PSB regulations generally on these providers.

In contrast to type 1 services, the use of IP in a type 2 scenario should not change the regulatory status of a company's telephone service. The use of type 2 VoIP is essentially a technology choice made by a company about its own internal network. This may or may not allow a company to run a better, more efficient network, but otherwise offers little difference in the way that companies hold out service to the public. This does not mean that the state should necessarily seek to impose heavy regulatory requirements; many companies using type 2 VoIP should qualify for nondominant status.

Policies

- The state should forbear from subjecting "type 1" VoIP services to PSB regulation and should attempt to find alternative means to address other important public policy issues.
- (See additional policies that relate to VoIP in the subsections below on "Virtual Numbers," "Local Number Portability," and "E 9-1-1" and in the "Existing State Universal Service Fund" subsection of Section 5, the "Universal Service" section.)

Strategies/Action Plans

- The legislature should provide the PSB with additional authority under state law to forbear in whole or in part from requiring CPGs for nondominant companies to whom the PSB has granted forbearance from all of the Title 30 requirements currently listed in 30 V.S.A. §227c.
- The PSB, by rule or order, should act to forbear from regulation of type 1 VoIP services, as well as computer-to-computer voice services that do not use telephone numbers.

NETWORK INFRASTRUCTURE STANDARDS

The emerging range of retail service choices that Vermonters can access is supported by a limited number of physical telecommunications networks that connect Vermonters to each other and the outside world. The quality and capabilities of these networks are critical to Vermont's future.

HIGH-SPEED SUPPORT

Data transmission was once an ancillary use of telephone networks and was often accomplished through facilities that were segregated from facilities used to transport voice traffic. Data uses have grown and will continue to grow exponentially while voice traffic volumes are relatively stable. Voice service will, in the near future, become an ancillary service of a network that is evolved and designed principally to handle data. In order for Vermonters, Vermont

businesses and Vermont institutions to be competitive, these services cannot be available only in selected areas. High-speed data services must become available to all subscribers throughout the state. The primary obstacles to making this objective a reality are the required upgrades to or replacement of "last mile" facilities (i.e. the telephone distribution plant that connects customers' locations to telephone central offices) that were designed and built to carry voice traffic, not data.

All of the facilities-based local telephone companies have made at least some progress in rebuilding and reconfiguring their networks to support the next generation of telecommunications services. In the case of some independent telephone companies this transformation has been extensive. Typically, it involves pushing fiber deep into the network to numerous remote terminals and shortening the remaining copper loops greatly so that they are capable of high DSL speeds. Other possibilities loom. Fiber optics all the way to the individual premise would provide nearly limitless capacity. The cost of fiber networks is close to an economic tipping point, and it could very well be pushed over the edge of cost-competitiveness if implemented on a wide scale by large national companies. Regardless of the exact strategy used, the bottom line is that "voice grade" is no longer a sufficient standard for the state to hold its local exchange networks to. This has already been recognized by mainstream organizations such as the U.S. Department of Agriculture's Rural Utilities Service (RUS), which insist that borrowers building or upgrading rural telephone plant design their networks in such a way that they can support video to the subscriber and minimum data transmission rates of 1 Mb per second.[7]

The Rural Utilities Service insists that borrowers building or upgrading rural telephone plant design their networks in such that they can support video to the subscriber and minimum data transmission rates of 1 Mb per second.

Policies

- Local exchange carriers should be upgrading their last mile infrastructure to be capable of providing mass-market broadband services to all customers. Any remaining copper loops should be short enough in length to support high-quality video over broadband to customers, either presently or with modest additional upgrades to line electronics.
- Local exchange carriers should evaluate the life-cycle cost of deploying fiber to the premises including maintenance costs. If projected costs and revenues support fiber-to-the-premises projects, LECs should begin to convert their outside plant to fiber.
- Fiber-to-the-premises pilot projects by LECs should be supported even if impacts on regulated revenue requirements are modestly unfavorable if conducted by LECs for the purposes of gaining real-world experience with the technology and evaluating cost and consumer response.

REDUNDANCY AND DIVERSITY

People expect telecommunications service to work reliably, and for some organizations and businesses that reliability is mission-critical. Telecommunications networks tend to concentrate the traffic of a large number of users onto a few high-capacity facilities as it travels over distance. Loss of service on these facilities can cause harm to large numbers of customers. Redundancy is the technique of operating multiple facilities capable of providing a service to guard against failure on one facility. While redundancy alone can protect against equipment

failure, service is still vulnerable to interruptions caused by such threats like a cable cut if redundant facilities (such as dual fiber optic pairs) traverse the same physical route. Redundancy is enhanced when redundant facilities traverse physically diverse paths. Some entire networks, such as Telcove's Vermont fiber optic network, are designed so that all routes are redundant and geographically diverse. While many Vermont phone exchanges are connected to each other by interexchange facilities that are both redundant and diverse, some are not. Depending on which inter-office routes are disrupted, all phone customers in an exchange may be unable to make calls beyond their own exchange during an event such as a cable cut. For example, Verizon and several independent-owned telephone exchanges northwest of Burlington experienced outages in 2002 and 2003 as a result of cable cuts. Such outages have serious implications for public safety, as callers were unable to reach 9-1-1 emergency dispatchers. Such outages also have implications for commerce. Redundancy and diversity issues are not limited to local exchanges; outages can occur on interstate facilities. For example, a June 2003 fiber cut in New York State interrupted Adelphia Cable's Internet access service and MCI's long-distance service in Vermont. These companies had not arranged diverse facilities.

The most telecommunications-dependent customers achieve redundancy by purchasing service over the networks of two or more providers, although providers with separate facilities are available in only limited areas of the state. Redundancy and diversity may be points of competition between carriers that are vying to serve a large business or institution, but that is not presently the case for the vast majority of consumers. To the extent that competitive alternatives exist, the competitors in all probability are leasing or re-selling the incumbent local company's network facilities, and their service will be only as reliable as the incumbent's. Network redundancy and diversity does not, at present, seem ripe for a market solution and should therefore be considered as a subject for minimum standards or an explicit incentive framework.

In addition to dependence of phone service on inter-office and inter-regional facilities, the reliability of phone service is vulnerable to cable disruptions or equipment failures in the distribution plant that connects customers to their service provider's local central office. While providing all customers with complete redundancy in local loop facilities would be costly and possibly excessive, a number of telephone companies in Vermont have linked their remote terminals in the field with SONET rings that provide redundancy in the "feeder" portion of the local loop. This extension of redundancy increases the reliability of the network.

Policies

- All local exchange carriers should build or arrange for redundant, physically diverse interexchange facilities to all exchanges served such that loss of service on one route does not cause an interruption of interexchange service.
  - LECs that choose not to construct their own facilities to achieve these ends should lease circuits or enter transport agreements with other carriers.
  - Interconnected LECs should maintain physically diverse redundant connections, either directly or indirectly through a third-party LEC.

- All interstate interexchange carriers should maintain physically diverse redundant connections in and out of Vermont such that loss of service on one connection does not cause an interruption of interexchange service.
- Facilities-based LECs should look for opportunities to extend redundancy and physical diversity into the feeder portion of the loop when planning and improving their networks.

POWER BACK-UP

Robust battery back-up has long been a feature of central offices that have contributed to the reliability of telephone service so that consumers could call even in the event of a power outage. Although once most customers were connected directly to the central office, today telephone companies provide many consumers' telephone service through remote terminals in the field. These facilities allow companies to use copper loops more efficiently, improve line quality, and help deploy broadband services. They also require an electric power supply to operate. Not all remote terminals have been equipped with sufficient back-up in the past. Consumers served by remote terminals should not have a lower standard of reliability than those served by central offices. Cell sites are another type of remotely located facility that more and more Vermonters are depending on for service. Although evidence has not come to light that these facilities are not properly equipped with power back-up, it bears stating that power back-up at these facilities and on the landline phone facilities that connect cell sites to switches are becoming, if anything, more important.

Policies

- Local exchange carriers with facilities should maintain sufficient battery or generation back-up available to maintain power indefinitely on both central office and remote terminal equipment during an extended commercial power outage.
- Wireless telephone providers should maintain battery or generation back-up available to maintain power at antenna sites during an extended commercial power outage.

POLE ATTACHMENT POLICY

As a rural state, utility poles provide the primary locations for communications companies to place their facilities that deliver services to Vermonters. Fair and nondiscriminatory access to these bottleneck facilities is crucial to the success of cable and telecommunications companies, whether incumbent or non-incumbent. Pole attachers should contribute fairly to the costs of jointly used facilities, but poles should not be a source of extraordinary revenue or a means of slowing market entry. Over the past several years the PSB and PSD have reformed pole attachment policies and rules applicable to pole-owning utilities and the entities that seek attachments to those poles. This progress is important and must be both maintained and sustained.

Policies

- When utility poles are shared, the PSB should assure fair and nondiscriminatory access to these facilities. Costs associated with these facilities should

also be shared in a manner that is fair and nondiscriminatory including, for example, pole rentals and attachment conditions, survey fees, and make ready charges.

RATES

The days of the PSB setting a single set of rates available to each customer for local and long distance calling in Vermont are still here to a certain extent, but they are waning. It is time to review and re-examine the role of the PSB and PSD in this traditional area of regulatory activity.

LOCAL RATES AND ACCESS CHARGES

Competition and technology are providing new options to retail customers for local and long distance calling, often at lower prices. One way that PSB policy very much continues to influence the rates customers pay for local and in-state long distance is by settling disputes and setting rules on rates and other terms for when and how much telephone companies pay each other for originating or terminating calls. These rules and decisions can either accommodate or slow down the rate of change for new calling options.

Given changes in technology, competition, and the types of calling packages that competition is offering consumers, it is time to review policies on wholesale and retail local calling areas, access charges and local usage rates.

Prices for telecommunications services were historically set to approximate the underlying costs to set up and bill for phone calls, switch and transport telecommunications traffic and remunerate inter-connecting carriers for their costs to originate, transport or terminate calls. (The term “cost” as it is used here and typically used in ratemaking includes a margin to allow for reasonable return on investment.) The network configurations, technologies and interconnection arrangements used to accomplish these tasks have changed constantly since the inception of telecommunications networks, and will continue to change. Service providers and regulators have been hard-pressed to modify service rates at the pace with which the costs have changed. In many cases, rate structures that provided carriers sufficient revenue streams in an era of monopolies or limited competition are not sustainable in the face of competition. Yet, in many cases, abrupt re-balancing of rates to align with economic, underlying costs would cause difficult and disruptive rate increases to certain services and classes of customers. Accordingly, in many instances, rates have been adjusted incrementally and opportunistically when cost decreases or periods of cost stability have allowed. This approach offers the benefit of "winners, but not losers" from rate re-balancing, although the advent of competition has forced or may require a more accelerated approach.

The distinction between "local traffic" and "toll traffic" is foremost among the rate structures out-of-synch with underlying costs and under pressure from changes in technology and the industry. Landline competitors and wireless companies have introduced "all distance" local/toll calling packages with either unlimited, flat-rated pricing or a bucket of any-distance minutes. Verizon and several of the incumbent independent LECs have followed suit. Voice over the Internet Protocol has arrived, with niche carriers introducing service in 2003 and 2004, and mainstream carriers such as AT&T and Verizon introducing similar services nationally in 2004. Moreover, mobile phones, e-fax services, and

"virtual number" services (discussed at length with other telephone numbering issues below) have all eroded the concept of a telephone number being associated with a specific geographic location - an assumption around which telephone traffic has historically been classified as "toll" or "local" and upon which intercarrier compensation arrangements have been built. Moreover, current rules sometimes produce counterintuitive results for intercarrier compensation by relying on physical geography. Federal rules permit the PSB to define local calling areas in Vermont, but allow competitive telephone companies to opt for a single point of interconnection in the state with an incumbent telephone company. The PSB has previously ruled that local calling areas for intercarrier compensation are the same in Vermont as those for the incumbents' minimum local calling areas. While this seems natural, exchanges that are nearby geographically can be less so as a call travels the telephone network. When a consumer makes a local call to another telephone company's customer, the company originating the call must transport it to the point of connection with the other company (even if that point is far across the state), and receive no compensation from the other company, or even pay compensation to the terminating company. If the consumer makes a long distance call within Vermont, the originating company will receive toll or access compensation, even if the call is a relatively short distance toll call. Maintaining the current usage charge structure in Vermont without reforms is likely to pull the PSB and PSD into a series of complicated intercarrier disputes about who must pay various costs, and when. Rebalancing and simplifying the rules for intercarrier compensation will make it easier for carriers to focus on creating value for customers through their calling plans.

The PSB substantially reduced Verizon's intrastate access rates (essentially, its wholesale toll rates) over the last three years as well, bringing those rates closer to underlying costs. The access rates of Vermont's other local phone companies, the Independent LECs, remain substantially higher than underlying costs. (For a comparison of incumbent telephone company access rates, see Section 3, "Telecommunications Almanac.") Because revenues from these access services constitute a substantial fraction of those LECs' total revenues, aligning rates to costs is a challenge, whether through reduced access rates or expanded local calling areas. The disparity between rates and costs makes the incumbent LECs all the more vulnerable to revenue losses, and invites other carriers to transport or exchange traffic in ways that minimize those carriers' costs, but that which are inefficient from an overall perspective. In recent years, significant progress has been made in reducing or keeping local dial tone rates low and relatively affordable. Revenue declines, to the extent the local companies are experiencing them, are principally to usage-based categories (access, toll and local usage). Over time, a greater proportion of telecommunications traffic will likely bypass the traditional switched network in favor of wireless or the Internet, yet Vermonters will expect that local companies will continue to maintain an adequate and reliable local phone network. The best way to enable local phone companies to meet this responsibility may be to provide them with a relatively stable revenue stream that relies heavily on fixed rates or rates that are not subject to bypass. The creation of a state fund to support universal telecommunications service in areas with a high cost of service, discussed in Section 5 (see subsection on "State Universal Service Support for High-Cost Areas"), would provide an additional support mechanism to companies who serve the hard-to-serve in the face of

declines in traditional support mechanisms. Overall, stability of dial tone rates is a reasonable objective; opportunities to reduce rates should instead focus on reducing usage-based rates.

The PSD's 2003 telephone survey indicated that Vermonters were satisfied with their current local calling areas, but were interested in other local calling area options. Many were unwilling to add much to their local bill to save on long distance. Allowing competition and innovative marketing by telephone companies to provide consumers with calling options is a good way to address this somewhat diffuse popular opinion. Addressing tensions that are arising as past intercarrier compensation policies and decisions age is a good way to promote innovation and options for consumers.

Previous sections of the plan described the potential for FCC action to restructure intercarrier compensation. (See the subsection on "Federal Preemption" in Section 1, "Telecommunications Trends" and the subsection on "Federal Universal Service Support" in Section 5, "Universal Service.") It is even possible that the FCC will preempt state authority over intrastate intercarrier compensation and eliminate all intercarrier compensation. The Notice of Proposed Rulemaking (NPRM) in which this possibility has been raised has been pending for three years in 2004. Regardless of this possibility, there are good reasons for the PSB to address the intercarrier compensation issues raised here. Similar issues to the ones raised here motivate the FCC NPRM. Should the FCC continue to delay action, these issues will not go away in Vermont. Should the FCC eliminate intercarrier compensation, including intrastrate intercarrier compensation, Vermont may have limited time to consider and deal with the impacts of such an event. Addressing the issue proactively will allow Vermont more time to act thoughtfully.

Within local dial tone rates, Vermont has made significant progress in bringing business and residential rates closer together. (See the "Retail Rates" subsection of the "Telecommunications Almanac," Section 3.) Nevertheless, business rates remain higher, and there is little reason to believe that the amount of difference in the rates accurately reflects differences in the cost of providing residential and business telephone lines. A measure of rate rebalancing between residential and business rates may be necessary.

Policies:

- To the extent that it can be done without causing rate shock, rate-regulated LEC usage rates for measured local usage and access rates should be set at similar, cost-based levels, while accounting for possible differences such as transport distances and least cost methods of traffic routing.
- Until usage rates are set at or near to cost (including a reasonable rate of return on investment), reductions in usage rates should be accorded higher priority than reductions in dial tone rates.
- To the extent that independent telephone companies require above-cost access charge revenue to maintain affordable dial tone rates, it is preferable to assign the non cost-based component to a terminating carrier common line charge instead of spreading the non cost-based component equally over all the access charge elements.

- Requirements for incumbent local telephone companies to have calling plans with local measured service caps should be retained in the near term, but should be re-examined in those service territories that have universal, affordable broadband access or affordably-priced unlimited local calling plans.
- Differences between regulated business and residential dial tone rates, if any, should reflect differences in the cost of the services.
- When rebalancing rates is performed outside the context of a rate investigation rate-regulated companies should be allowed to have revenue neutrality.

Strategies/Action Plans

- The PSB should open a generic investigation into wholesale local calling areas and access charges, with an objective to rebalance and simplify local and intrastate access intercarrier compensation obligations to reflect changes in calling patterns, competitive markets, and costs. During the course of this investigation, the PSB should also consider the challenges and opportunities that could arise if the PSB rebalanced and simplified intercarrier compensation. These include:
  - Would changes to wholesale local calling areas and access charges allow either incumbents or competitors to offer more attractive retail expanded local calling areas or local calling options?
  - If usage rates are lower, is keeping local measured service caps essential, especially in areas where broadband Internet access is available?
  - Would a narrowing in the difference between local and toll charges or an expansion of local calling areas create a more attractive option to consolidate rate centers and conserve telephone numbers? (See subsection on "The 802 Area Code" below.)
  - How could different rules on wholesale local calling areas and lower access charges simplify the PSB's treatment of foreign exchange, foreign exchange-like, and virtual number services? (See subsection on "Virtual Numbers" below.)
  - How might changes in intercarrier compensation affect the affordability of telephone service, and are there sufficient universal service mechanisms available to compensate?
- The PSB should base access charge and local measured service rates on updated cost study results.
- If the conclusion of a rate case provides the PSB with the opportunity to reduce incumbent LEC rates, highest priority should be given to above-cost originating access rates. Parity between originating and terminating rates should not be a priority until originating rates are at or near cost.
- In telephone company rate cases the PSD and PSB should seek to equalize business and residential single line rates unless there can be shown clear cost-based reasons for maintaining higher business rates.

SPECIAL ACCESS

"Special access" is a regulatory class of services that includes the workhorse of data communications, the T-1 circuit. Once used primarily by a small number of large customers, special access services are increasingly going mainstream.

What is "special access?"

Special access circuits were high-capacity lines originally deployed typically for voice services; for example, they would be used to link a large user's PBX to a long distance carrier's network to obtain lower long distance rates. This arrangement avoided the per minute access charges that the local company would otherwise charge the long distance carrier. Instead the local company collected "special access" charges that depended on the distance traveled by the dedicated high-capacity link. While special access circuits are still used in voice applications, for example, linking cell sites back over the landline network to cellular carriers' switches, increasingly they are used as high-capacity links in data communications networks.

One of the latest applications is to deliver a combination of voice lines and high-speed data to small offices over a single facility. Special access circuits also form the backhaul for many of the broadband services offered to the mass market. Therefore, the price of these services can influence the price and availability of other telecommunications services. Despite their growing importance there has been relatively little regulatory focus on these services especially compared to local dial tone rates and the "regular" access charges that affect long distance rates. There is reason to believe that the costs to providers associated with these services may have changed in the period since they were last examined. For example, a form of DSL can now provide an equivalent to the traditional T-1 service, 1.5 Mbps of data transmission in both directions. Yet, a T-1 special access circuit, when purchased through Verizon's intrastate tariff, costs at least $453 per month (and often much more than this), in comparison to roughly $60 per month for a combination voice and DSL line. Increasingly, competition pressures incumbent providers selling special access services over the "middle mile." There is much less often an alternative to the incumbent's facilities for providing special access circuits over the "last mile."

Strategies/Action Plans

▶ The PSD and PSB should examine the extent to which lower prices would increase usage of intrastate special access services and consider undertaking a cost study of special access services, at a minimum for T-1 and T-3 circuits.

NUMBERING POLICY

Telephone numbers are essential pieces of "virtual real estate" in the telecommunications realm. Numbering issues impact a wide variety of other issues discussed in this plan, including competition, consumer protection, and use of the Internet. In addition, the 802 area code is an important piece of Vermont's identity, and extending its useful life as Vermont's sole statewide area code may be in the public interest. This section deals in greater detail with three numbering issues that are to varying degrees related: the 802 area code, local number portability, and virtual numbers.

THE 802 AREA CODE

Vermont has made significant strides in delaying the exhaust of the 802 area code, as detailed in the "Telephone Numbers" subsection of Section 1, "Telecommunications Trends." The credit largely goes to the PSB's implementation of thousands block number pooling, which increased the efficiency with which telephone numbers are assigned and used in Vermont. This measure is made more effective when the PSB continues to actively police the assignment of numbers. While telephone companies are entitled to blocks of numbers that they need, they must abide by rules that require them to make requests for number blocks based on realistic forecasts.

While greatly reduced, the risk of exhaust for the 802 area code has not been completely eliminated. Actions to extend the life of the 802 area code taken

while a crisis is still far off and the remaining pool of numbers is still relatively large will have the greatest effectiveness. One step that remains available is rate center consolidation. Reducing the number of rate centers (rating areas) would reduce the number of blocks of 10,000 numbers assigned to each carrier, thereby slowing the rate of exhaustion of numbers. Vermont has 141 rate centers, which means there are 141 local calling areas. If there were only one local rate center for the entire state, each new entrant would get a single block of 1,000 or 10,000 numbers for the entire state. In addition to conserving numbers, reducing the state to a single rate center would also have the effect of eliminating in-state long distance. Eliminating in-state toll would presumably raise local rates, but perhaps not as much as might be expected. A less drastic step might simply be to reduce the number of rate centers by a factor of 5 or 10. As rate center consolidation has revenue and rate impacts, it should not be examined solely in the context of its impacts on the 802 area code. It may be advantageous to combine rate center consolidation with a program of access charge reform, simplification of wholesale and/or retail local calling areas, and the clarification of policies dealing with virtual numbers and foreign exchange service. Consolidating rate centers would tend to reduce the complexity of disputes involving local and toll distinctions, or at least reduce the scope of such disputes, especially if care was taken to establish rate centers that more closely reflect the configuration of the underlying network. That underlying network has changed in the decades since rate centers were first defined, and the network continues to evolve. Telecommunications networks today are more likely to allow a call to be transported over great distances even if the final destination is close by. (This is not unlike an airline that routes passengers through a hub in Detroit to transport passengers from Burlington to Miami.) The correlation between telephone network distance and distance "as the crow flies" is less than it once was which is an argument for larger rate centers.

Actions to extend the life of the 802 area code that are taken while a crisis is still far off will have the greatest effectiveness.

Strategies/Action Plans

- ▶ The PSB should continue to regularly audit carriers' use of assigned numbers and order unused blocks returned to the pool. It should impose penalties on companies who exaggerate use projections to obtain or hoard numbers.
- ▶ The PSB should consider rate center consolidation when investigating wholesale local calling areas and access charges. (See subsection, "Rates," above.)
  - The PSB should examine consolidation of groups of rate centers by grouping together the existing rate centers in Verizon host-remote clusters and independent company service territories, although some modifications may be necessary.

LOCAL NUMBER PORTABILITY

The ability for business and residential consumers to keep their telephone numbers is a key to reducing the barriers to customer choice. Consumers are more likely to exercise their right to choose if it will produce fewer disruptions to their use of the service. The market discipline this imposes on competitors means that local number portability (LNP) is almost always desirable in telephone markets, even if there are transition issues for carriers to implement it. The FCC's orders extending LNP to the wireless telephone market and granting

consumers the ability to port numbers between wireless and wireline carriers were important victories for consumers and the telecommunications marketplace.

Internet telephony providers, in particular the "type 1" Internet telephony providers described above, raise some special issues in connection with local number portability. Some VoIP companies offer their customers the option of porting their existing telephone numbers to the service. This is not in itself unreasonable (and is likely to please consumers), but it raises some questions. Number portability has been conceived as something that occurs between telecommunications companies. If a VoIP company is not a telecommunications company, then how does it port numbers? Obviously, this is part of a larger question about the relationship of a type 1 service provider to the public switched network. If such a provider does not become a LEC, then it must buy local telephone services from a LEC in order to create a gateway between the Internet and the PSTN. The type 1 provider's conventional LEC would be capable of porting numbers to the telephone lines the type 1 provider buys from the LEC. There are issues of fairness involved if one LEC ports a number from another LEC that belonged to telephone customer 1 (the end user) and assigns it to telephone customer 2 (the type 1 VoIP provider). If the type 1 provider is now the "customer" on the ported telephone number, what recourse does the end user have if he or she wants to port that number away from the VoIP service to some other telephone service? Local number portability is an important consumer benefit that enhances competition. Clearly, if consumers' numbers may be ported to VoIP services then they should have the clear and unambiguous right to port numbers away from these services.

Policies

- The PSB and PSD should support wireless number portability in Vermont including portability between wireless and wireline numbers.
- VoIP service providers should not receive customers' ported telephone numbers unless they allow customers the unambiguous right to port those numbers away from the service provider.

VIRTUAL NUMBERS

Not long ago telephone numbers were firmly anchored to geography. Most customers only had the option of obtaining a telephone number associated with their local exchange. And in fact the telephone number was generally assigned to a switch physically located in that exchange. For those that wanted to have a telephone number in a distant exchange (along with that exchange's local calling area), foreign exchange services were available but were expensive and not commonly used. (Call forwarding is a more recent "traditional" service for making a call appear to be delivered somewhere it is not.) As with other telecommunications services involving distance, prices have come down significantly due to a combination of reductions in the unit cost of telecommunications transport, mobile technology, the Internet, and competition. Now a variety of service providers are offering their customers the ability to have a telephone number associated with a distant exchange at a low price. The most obvious examples of this phenomenon are wireless telephone providers. A customer with a Rutland, Vermont, wireless number can be traveling (or even have moved

to) California, and callers in the Rutland local area can still reach him or her for the price of a local call. The implementation of wireline-to-wireless number portability will only increase the power of this trend. Also, LECs now offer ISPs distant local numbers in order to offer local dial-up access numbers to the Internet over a wide area without the need to establish many multiple local physical points of presence.

A more recent and striking example is the virtual number options offered by many type 1 VoIP providers (and Internet faxing providers), who offer their customers the ability to choose a telephone number without regard to their location. A customer located in Albany, Vermont could have a Manhattan phone number, or vice versa. For that matter, since the customer connects to the service provider over the Internet, there is nothing to stop someone located in Bangalore, India or Tel Aviv, Israel from obtaining a Vermont number. Furthermore, even if a Vermont number is established at a Vermont location, some type 1 VoIP services share some of the portability characteristics of wireless telephone service. Since these type 1 VoIP services are tied to an IP telephony device, not a location (like a consumer's wireless telephone service is tied to a particular cell phone at a given point in time), users can easily move type 1 services. Take

The use of the term "virtual number" in this plan

The term "virtual" has become a charged word in connection with numbering issues, and its use presents some problems. Therefore, it is worthwhile to explain why and how its use is intended in this plan.

Although the term currently has a pejorative sense in some regulatory contexts, this originally was not so. In the mid to late nineties, the adjective "virtual" came to be used to describe services that appeared to be in a location but in some sense were not. For example, virtual ISDN was a service that made it appear that certain switches offered ISDN service to their exchange, when in fact the service offered was served out of a distant exchange. This virtual service was a benefit to consumers who otherwise would not have had access to the service. A variety of LECs began to offer customers such as ISPs "virtual" numbers that allowed the ISP to appear as if it had a modem bank in a particular local calling area when in fact traffic was delivered to it at a distant location. This helped to sustain the availability of statewide dial-up Internet access at local calling rates. Unfortunately, such services were subject to abuses. In Docket 6742, the PSB examined the way that the CLEC GlobalNAPs had implemented its virtual NXX service (see subsection on "Telephone Numbers" in Section 1, "Telecommunications Trends") and concluded that it had the effect of unfairly shifting transport costs to Verizon and avoiding long distance charges, and stated that virtual NXXs were contrary to public policy. However, the PSB also stated that there could be legitimate services that made it appear to a caller that a user had a number in a rate center in which they were not in fact physically located. It pointed to foreign exchange (FX) services and also stated that there could be permissible "FX-like" services. In Docket 6209, the PSB took testimony on whether or how to apply its ruling in Docket 6742 generally to the whole industry. While there was considerable disagreement between parties about the meaning of the terms "virtual," "FX" and "FX-like," some parties (including the PSD) used "virtual" as a name for the types services the PSB should prohibit and "FX" and "FX-like" as a name for the types of services the PSB should permit.

In the world of marketing, especially the marketing of Internet telephony providers, and among the early adopters of this technology, these semantic distinctions are not yet established. For this reason, and for simplicity's sake, in this plan the term "virtual number" is used generically to refer to any number that appears to be in a particular location but in fact is being used by someone in a geographically distant location. Some applications of "virtual numbers" may be contrary to public policy, and others (as the term is used here) may in fact qualify as "FX" or "FX-like" services (as those terms have been used in Docket 6209). The use of the term "virtual" in the plan in and of itself should not be taken as approval or disapproval of a particular service.

an IP phone or an analog telephone adapter that is registered with Vonage from a home Internet connection, plug it in to an Internet connection at work, or at a hotel room on the road, and it will continue to work with the same telephone number despite the change in location. There is no reason why Wi-Fi enabled wireless IP phones could not simulate a cell phone wherever broadband wireless access is available, making these services truly mobile. If type 1 VoIP services exist at all, it is nearly impossible to prevent the use of virtual numbers.

Vermont will be swimming against the tide if it tries to ban the use of virtual numbers entirely. The ability of business and residential consumers to keep their number when they move, to have a number that comes with them when they travel, or have a "virtual" presence in a community of interest is an example of an innovative response to the high prices of traditional foreign exchange and long distance call forwarding that policymakers should expect from competition. There are, however, legitimate issues regarding the proper compensation for local telephone companies that must deliver or receive traffic from the LECs offering virtual number services and regarding the rate at which telephone numbers are used.

One basic principle should be that carriers who wish to offer customers a telephone number in a local rate center should have a legitimately local presence. Customers or switching facilities physically located in an exchange where a local carrier has a block of numbers are the preeminent examples of such a local presence. This is not to say that a LEC with a block of numbers it has obtained for use by customers or a switch in an exchange should not be able to offer virtual numbers out of that block to other customers who are remotely located, subject to certain conditions. Going further and allowing whole number blocks that are entirely virtual, though, runs too great a risk of interests outside the state consuming numbering resources entirely for non-Vermont customers; this is especially true if Vermont's policies on this issue are more lenient than that of other states. (A national policy could significantly change this consideration.)

A second principle that is related to the first deals with how calls to virtual numbers are treated for intercarrier compensation and exchange of traffic. All virtual number services have the effect of providing retail customers with the ability to avoid toll charges on certain routes. For example, if the owner of a cell phone with a Rutland number is called by a Rutland resident, the call is local, even if the phone is in California. If a call travels between local carriers a virtual number can change the intercarrier compensation. This is true even of traditional foreign exchange service. Although a Middlebury customer buying a traditional Verizon foreign exchange service with a Rutland number pays Verizon a fixed monthly fee to transport such calls from Rutland to Middlebury, the customer does not pay neighboring telephone companies like VTel anything. Nevertheless, when VTel's customer in Killington calls the Rutland number of the Middlebury customer, VTel collects local usage charges (if any) from the caller instead of the higher originating access charges from a long distance company it would have collected if its Killington customer had called the Verizon Middlebury customer at a Middlebury number. As virtual number services become possible at lower and lower cost, this kind of situation will become more common. The PSB should not seek to ban virtual number services to preserve access charge revenues—in any event this is likely

to be extraordinarily difficult to enforce against Internet and especially wireless telephony services. The increasing ease by which telecommunications consumers can bypass high access charges is instead another reason for the PSB to examine access charge rates and the extent to which local and in-state long distance charges should differ. Local telephone companies should not have to transport traffic to other companies who offer virtual numbers beyond a reasonable distance. As a general matter, it is fairer for companies who offer virtual numbers to pick up or drop off traffic at or reasonably close to the exchange in which the number is assigned or for them to pay someone else to do it for them. Federal policy complicates this matter somewhat by decreeing that CLECs are entitled to a single point of interconnection for local traffic with ILECs in Vermont. Nevertheless, if the PSB narrowed the difference between local and toll calling in Vermont, it would reduce the complexity of the virtual number issue.

In Docket 6209, the PSB has been investigating the use of "virtual NXXs." The clearest application of these numbers during the course of the investigation has been their use for dial-up Internet access. While the notion of calling the Internet was clearly contemplated by the PSB when it began this docket, not so was the notion of the Internet calling back. The decision in Docket 6209 may only serve as an interim solution. In Docket 6209 the PSB took as a given its prior policies on wholesale and retail local calling areas established in the mid-1990s and the access charge and local usage rates already in place. Given the changes in technology, competition, and the types of calling packages that competition is offering consumers, it is time to review those policies. (See subsection, "Rates." above.) That is also the opportune time to review and establish complementary policies regarding the use and compensation for virtual numbers.

Policies

- The state should not attempt to block Internet telephony providers from offering virtual numbers to customers unless matched by similar efforts in a critical mass of other states or the FCC.
- The PSB should allow telephone companies to offer some forms of virtual number services.
- When a telephone service provider chooses to offer a customer a number in a rate center at a distance from the customer's geographic location, the carrier offering the service should assume the responsibility for substantial transport between the nominal telephone number location and the customer's actual physical location.

Strategies/Action Plans

- The PSB should prevent carriers from retaining blocks of numbers for extended periods in rate centers in which they have no customers or switching facilities physically located.
- The PSB should re-address fair but flexible rules for the use of "virtual" or "foreign exchange" numbers when addressing issues of local calling, access charge reform, and rate center consolidation.

E 9-1-1

Vermont's statewide E 9-1-1 system is one of the premier E 9-1-1 systems in the nation. An independent E 9-1-1 Board oversees the E 9-1-1 system in Vermont. The Board is charged with designing, installing and overseeing the operation of statewide enhanced 9-1-1. The Board fulfills its responsibilities by maintaining and auditing the database, network, Public Safety Answering Point (PSAP) and call-taker components of the system, by providing an ongoing training and certification program for 9-1-1 call-takers, by maintaining the statewide enhanced 9-1-1 Geographic Information System (GIS) database and by engaging in a variety of other activities designed to ensure the reliability and integrity of the system. The Enhanced 9-1-1 Board oversees nine 9-1-1 PSAPs. They are located at the Springfield Police Department, the Hartford Police Department, the Montpelier Police Department, the Lamoille County Sheriff's Office, the Saint Albans Police Department, the Shelburne Police Department, and the State Police Barracks at Williston, Rutland and Rockingham. A tenth PSAP was activated at the new Derby State Police Barracks in 2004. Further information on the status and challenges of Vermont's E 9-1-1 system can be found in the E 9-1-1 Board's annual report to the Governor.[8]

Competition poses new challenges to Vermont's E 9-1-1 system even as the initial challenges of establishing the system have been overcome. New entrants to the market frequently are at first not fully aware of their Vermont E 9-1-1 responsibilities or are not always diligent about them. Staffing at Vermont's E 9-1-1 Board needs to change to reflect this reality. Dealing with more companies simply requires more time than dealing with the limited number of telephone companies that used to serve all Vermonters. Ensuring compliance with Vermont's E 9-1-1 requirements must become the work of personnel dedicated to that function.

Competition and technology change pose new challenges to Vermont's E 9-1-1 system even as the initial challenges of establishing the system have been overcome.

Technology changes are also presenting emerging challenges to maintaining E 9-1-1 in the future, although those challenges are being addressed. A major weakness of type 1 Internet telephony services (see subsection on "Voice over Internet Protocol," above) as they have been deployed up until the end of 2003 is the lack of support for enhanced 9-1-1 service. Some service providers like Vonage have voluntarily added support for limited 9-1-1 service, but routing traffic to the correct PSAP has been problematic and there has been a lack of support for enhanced features like Automatic Location Identifier and automatic call-back if the caller cannot speak. Other type 1 providers simply have not supported E 9-1-1. While one might argue consumers should be free to choose their level of E 9-1-1 support, in reality consumers may not get to make an informed decision. When services are marketed as a telephone replacement, it may be difficult for consumers to appreciate the nuances in 9-1-1 coverage levels. It also greatly complicates the job of those who need to craft clear and concise public information about how and when to use 9-1-1. Emergency telephone service should be simple and straightforward enough that even children and the impaired will be able to use it in a crisis situation. If

Table 8.2:
E 9-1-1 calls 2002-2003

Year	9-1-1 calls	Cellular Calls		Abandoned Calls	
		Number	*%*	*total abandoned*	*%*
2002	188,840	57,747	31%	19,488	10%
2003	194,042	68,488	35%	17,063	10%

something looks like a telephone, it is likely to be used like a telephone in an emergency and should support enhanced 9-1-1. Moreover, support for E 9-1-1 on VoIP services should not present service providers with insurmountable technological obstacles. Fortunately, Vermont law provides authority for the Enhanced 9-1-1 Board to require E 9-1-1 support even from unregulated private telephone systems. The public education obstacles that this technology will present are more serious. Users will need to know that they must provide up-to-date location information to VoIP providers if E 9-1-1 operators are to find them in an emergency when they cannot speak. They will need to understand that Internet telephony devices, which require electric power, are only as good in an emergency involving loss of power as their battery or other back-up.

Fortunately, a voluntary consensus appears to be emerging between VoIP providers and the emergency services community regarding support for E 9-1-1. In December 2003, the National Emergency Number Association (NENA) and the Voice on the Net (VON) Coalition reached an agreement on action items leading to support for E 9-1-1 service for VoIP systems. (See sidebar, "NENA-VON Coalition Agreement.") Vermont's E 9-1-1 Board was an important participant in this national discussion. The E 9-1-1 system will also need to adapt to a future in which VoIP providers make it easier for consumers in Vermont to have telephone numbers with area codes in other states. While theoretically a "foreign area code" can be matched to a Vermont address, currently the tandems Vermont uses can only recognize up to four area codes.

Wireless technology also imposes new challenges for emergency call-takers. While wireless E 9-1-1 is improving, wireline E 9-1-1 technology still provides the exact location of a caller who cannot speak more consistently than wireless technology. As more people consider dropping their wireline phones and relying on wireless phones for their service at home, more people need to be aware of this and consider it before eliminating a conventional wireline connection to their home. This problem can be mitigated somewhat if consumers use newer handsets that take advantage of Wireless Phase II E 9-1-1.

Policies

- The Vermont Universal Service Fund (USF) rate should be

NENA-VON Coalition Agreement

In December 2003, NENA, the VON Coalition and a number of major companies involved in providing voice-over-IP equipment or services agreed on a set of action items:

- For service to customers using phones that have the functionality and appearance of conventional telephones, 9-1-1 emergency services access will be provided (at least routing to a Public Safety Access Point (PSAP) 10-digit number) within a reasonable time (three to six months), and prior to that time inform customers of the lack of such access.
- When a communications provider begins selling in a particular area, it should discuss with the local PSAPs or their coordinator the approach to providing access. This obligation does not apply to any "roaming" by customers.
- Support for current NENA and industry work towards an interim solution that includes (a) delivery of 9-1-1 call through the existing 9-1-1 network, (b) providing callback number to the PSAP, and (c) in some cases, initial location information.
- Support for current NENA and industry work towards long-term solutions that include (a) delivery of 9-1-1 calls to the proper PSAP, (b) providing callback number/recontact information to the PSAP, (c) providing location of caller; and (d) PSAPs having direct IP connectivity.
- Support for an administrative approach to maintaining funding of 9-1-1 resources at a level equivalent to those generated by current or evolving funding processes.
- Development of consumer education projects involving various industry participants and NENA public education committee members to create suggested materials so that consumers are fully aware of 9-1-1 capabilities and issues.

established annually at a level that assures the legislature's E 9-1-1 appropriations are fully funded.

- USF funding for state E 9-1-1 costs should be limited to those cost elements directly related to providing the E 9-1-1 service.
  - The E 9-1-1 Board should have primary responsibility for verifying state USF funds released for E 9-1-1 are consistent with that purpose. When allocating funds to other agencies for E 9-1-1, the legislature should provide for accountability mechanisms (such as quarterly itemized accounts) that enable verification by the E 9-1-1 Board.
- VoIP providers that allow customers to call telephone numbers should support all the capabilities of enhanced 9-1-1 provided to customers of traditional telephone service.
- Vermont's E 9-1-1 tandem vendor in the future should be prepared to support calls from large numbers of different area codes associated with Vermont locations.

Strategies/Action Plans

- The E 9-1-1 Board and Vermont's wireless carriers should work together to develop standard informational materials about the capabilities and limitations of wireless E 9-1-1 and to distribute them at the time of purchase. The materials should also encourage customers to upgrade old handsets to ones that are Wireless E 9-1-1 Phase II capable.
- The E 9-1-1 Board should create a position dedicated to enforcing compliance with Vermont E 9-1-1 laws and rules.

CABLE AND SATELLITE VIDEO PROGRAMMING

Cable has evolved from a platform for enhancing reception of broadcast TV signals to a multi-function communications platform. Although the portion of the plan that follows deals primarily with cable in its role as a video delivery system, cable infrastructure is also important to Vermont's future because of its ability to deliver high-speed data and voice.

Satellite TV is also a very significant platform for the delivery of video programming to Vermonters, as about one in three Vermonters subscribe to a satellite video programming service. Many Vermonters now have a choice of cable or satellite TV. Unlike cable TV service, satellite TV providers receive their authorization to provide service from the FCC, not the state. Many satellite viewers in Vermont can now receive local broadcast TV stations via their dish, although satellite viewers still receive less local programming than do cable subscribers.

CABLE LINE EXTENSION POLICY

Vermont has a long-standing line extension policy that merits continued support with some modification. Essentially, cable companies are required to extend lines into unserved areas where there is a reasonable expectation they will be able to cover the costs of doing so, based on a formula that includes the costs of construction, penetration levels, and average revenue per customer. Cable companies are also expected to annually count houses in unserved areas and

proactively build areas with qualifying density. This policy has been important to spur the delivery not only of cable TV but broadband Internet services in rural Vermont. Recent changes in the cable marketplace deserve to be reflected in the formula. One increased challenge to cable companies building into new areas is the prevalence of satellite dishes, which reduce the number of likely subscribers. (Recent cable CPGs have included line extension formulas that account for satellite.) On the other hand, while cable once was a predominantly residential service, cable's data services are now more appealing to businesses. Therefore, it is now appropriate to count businesses as potential subscribers as well as households.

Technology is also opening up new possibilities in how house counts are conducted. Electronic maps promise to make the process of counting houses easier and its results more useful. On the one hand, recent electronic filings by Adelphia of house count surveys and areas served by cable, as well as steps taken by the PSD to digitize house count maps, were instrumental in creating the maps of cable TV and cable modem service that appear in this plan and elsewhere. On the other hand, the annual requirement on cable operators to survey unserved areas is time-consuming and expensive. Towns and the E 9-1-1 Board collect most of the information needed for house count surveys—road location and the location of residences and businesses—and make it publicly available in a GIS format. GIS can not only store the results of cable company house counts but it can be used to identify areas of very low density, eliminating the need to frequently ride out and survey these areas.

Strategies/Action Plans

- The PSB should adjust future line extension formulas in rule and CPGs to account for satellite dish subscribership and businesses subscribing to cable video or data services.
- The PSB and PSD should evaluate the effectiveness of using GIS map models to reduce the need for cable companies to physically ride out unserved areas to count houses and businesses.
- The PSB and PSD should require larger cable companies (at least) to report house count surveys and areas served in a GIS-compatible electronic format.

CABLE CPG STANDARDS

Vermont has recently seen a string of cable refranchising proceedings. The next several years will see a number of small company refranchising proceedings and, as shown in Figure 8.1 and Table 8.3, a new round of towns in which Adelphia franchises will expire. (Adelphia has a number of operating companies in Vermont, which hold a number of distinct franchises, but not all of which expire at the same time.) While there are a large number of specific criteria for cable franchise renewal in state and federal law, it is worth stressing here a pair of broad priorities. First, part of the importance of cable infrastructure is its ability to deliver local content to Vermonters. Vermont's geography does not favor local broadcasting. Cable provides a medium that can deliver Vermont-specific commercial and non-commercial content to Vermont households at a time when public discourse and local commercial communication depend on this outlet as much as ever. Furthermore, cable operators have discretion in what program-

Table 8.3:
Cable franchise expirations in the next 5 years

Franchise expires	Company	Towns
2004	Opticable	Readsboro
2005	North Country Cable	Bakersfield, Berkshire, Montgomery
2007	Adelphia	Andover, Arlington, Athens, Baltimore, Barnard, Benson, Bridgewater, Castleton, Cavendish, Chester, Chittenden, Dorset, Fair Haven, Goshen, Grafton, Hubbardton, Ira, Jamaica, Landgrove, Londonderry, Ludlow, Manchester, Middletown Springs, Mount Holly, Peru, Pittsfield, Pittsford, Plymouth, Poultney, Reading, Rupert, Sandgate, Sherburne, Shrewsbury, Springfield, Stratton, Sudbury, Sunderland, Tinmouth, Wardsboro, Weathersfield, West Haven, Weston, Windham, Windsor, Winhall, Woodstock, Addison, Avery's Gore, Barton, Bridport, Brighton (Isl. Pond), Bristol, Brownington, Charleston, Charlotte, Coventry, Derby, Ferdinand, Ferrisburg, Glover, Hinesburg, Holland, Huntington, Irasburg, Jay, Lewis, Lincoln, Lowell, Monkton, Morgan, New Haven, Newark, Newport City, Newport Town, Ripton, Sheffield, Shelburne, Starksboro, Sutton, Troy, Vergennes, Waltham, Warner's Grant, Warren's Gore, Westfield, Westmore, Jericho, Richmond, Underhill
2008	Adelphia	Belvidere, Cambridge, Craftsbury, Eden, Elmore, Fairfax, Fairfield, Greensboro, Hardwick, Hartford (White River Junction), Hartland, Highgate, Johnson, Morristown, Norwich, Pomfret, Sharon, Sheldon, St. Albans City, St. Albans Town, Stannard, Stowe, Strafford, Swanton, Thetford, Walden, Waterville, West Windsor, Wheelock, Wolcott, Brattleboro, Brookline, Dummerston, Guilford, Halifax, Marlboro, Rockingham, Vernon, Westminster

ming appears on their systems; the programming that is available to the greatest number should inform, educate, reflect community voices, and promote important public conversations. In short, it should serve the public interest. Second, the cable network is an important asset to the community and it deserves ongoing investment and periodic upgrades to reflect industry norms. Without this investment Vermont risks losing an important communications conduit. Furthermore, cable infrastructure can now be a means of delivering various forms of communications service, not only cable TV. The ability to deliver voice and data as well as video over cable is desirable. While these other services may not always be appropriate subjects to address directly through a CPG for cable services, the state in its franchising role should consider how the terms of a CPG may affect the delivery of these other services to Vermonters.

Table 8.4:
Cable franchises with no expiration dates

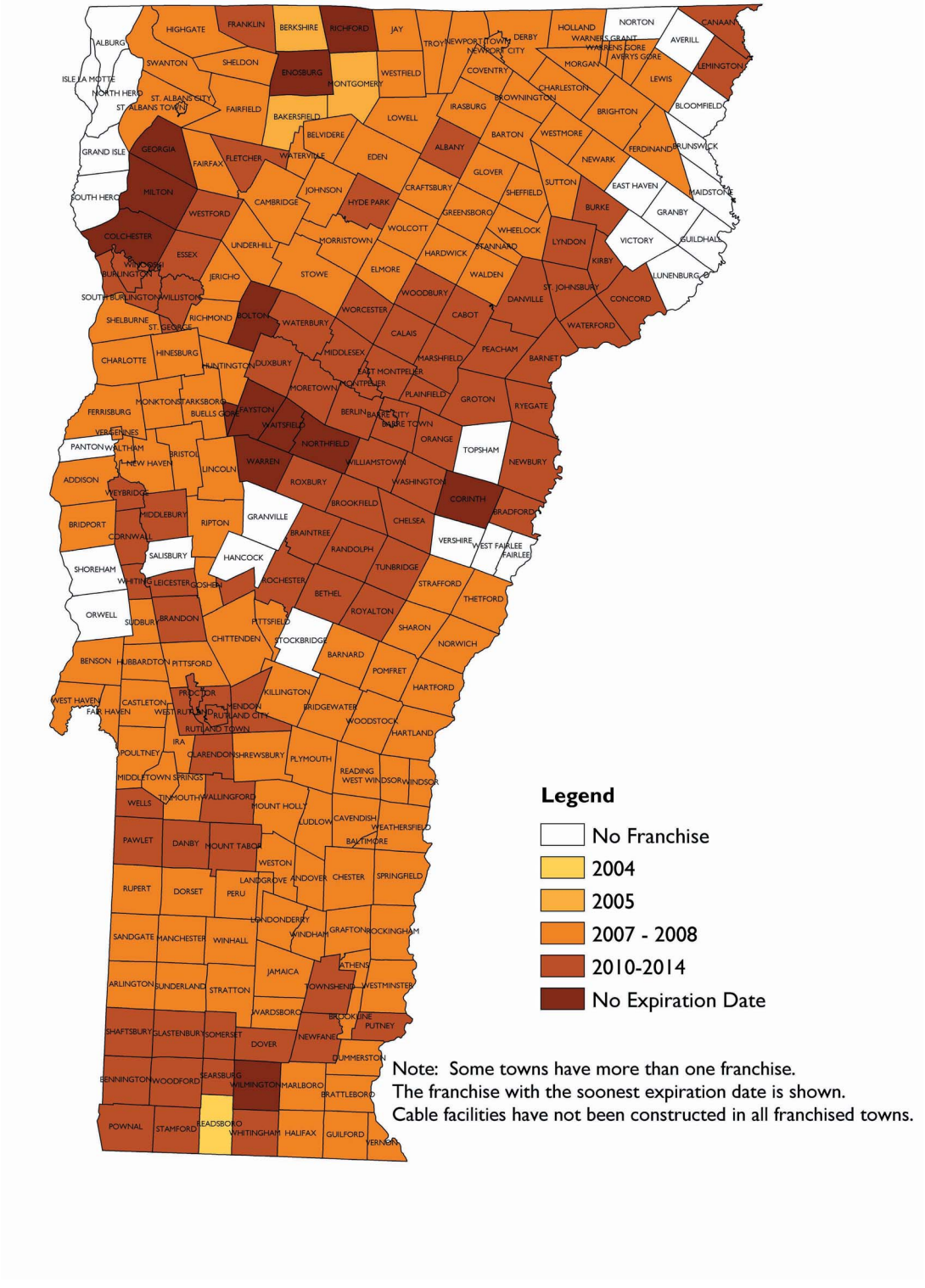
Company	Towns
Adelphia	Colchester, Fairfax, Georgia, Milton, Westford
Duncan Cable	Wilmington
North Valley Cable Systems	Bolton, Williamstown
Olsen's TV and Radio Repair	East Corinth
Smugglers' Notch Cable TV	Cambridge
Stowe Cablevision	Stowe
Trans-video	Berlin, Northfield
Waitsfield Cable	Buel's Gore, Duxbury, Fayston, Moretown, Waitsfield, Warren

Policies

► Cable CPG obligations should take into account important public policy objectives, among them encouraging cable operators to make investments in their system and offer new video, voice, and data services.

► To meet community needs, cable companies should provide as strong a public interest

Figure 8.1:
Cable franchise expiration dates



programming base as possible in its basic tier.

- Cable companies should carry a strong component of local content.
  - Cable systems should carry local digital broadcast content as it becomes available.
- All but the smallest cable systems should be made capable of two-way transmission in digital format.

PEG ACCESS

Public, Educational, and Governmental (PEG) access is recognized by Vermont state law as an important component of cable systems. These cable stations provide an outlet for community members and organizations to produce non-commercial programming and present programming of interest to their neighbors. They allow citizens to monitor government meetings and officials even when they cannot attend in person and they give local educators a conduit in the community. Over the course of the last 15 years, the number of locally-organized PEG Access Management Organizations (AMOs) has grown substantially. (See Table 8.5.) The survey conducted for this plan shows that the public continues to support the concept of PEG access by a considerable margin. Furthermore, a significant number of cable subscribers are regular viewers of PEG programming. Although the amount of reported PEG viewership is not overwhelming, very large levels of viewership for any individual cable channel, including commercial channels, are the exception, not the rule, in a digital cable environment of hundreds of channels. The levels of reported PEG viewership are respectable.

That increase in channels and cable system capacity has sparked a debate about the proper level of cable capacity to reserve for PEG access. PEG systems in larger communities are filling multiple channels with programming. The nature of the way cable channels are programmed has evolved. To accommodate the wider selection of channels viewers face and the practice of "channel surfing," cable networks are more likely to repeat programs in multiple time slots, sometimes on multiple channels. Increases in cable system capacity reduce the scarcity of channels as a reason not to expand successful, thriving PEG operations when expansion could better serve the community. At the same time, increases in cable system capacity alone are not sufficient reason to increase the capacity dedicated to PEG. There must be important community needs that increased capacity will meet, and the state in its franchising authority role should consider how capacity allocations will impact other important public policy objectives, among them encouraging cable operators to make investments in their systems and offer new video, voice, and data services.

The capabilities of a PEG access operation are not measured merely by the number of channels it uses. The ability of PEG stations to originate live programming from a variety of locations around the community adds value to the PEG programming experience. Local government meetings and candidate forums are examples of how PEG programming, and especially live PEG programming, contributes to democracy in the community. Furthermore, PEG access can serve the public by being more than just a place to play tapes. When

PEG access includes facilities and training for members of the community to learn video production, it contributes to media literacy in the community.

Changes in video technology affect PEG as well. Video is going digital. To utilize the attributes of digital television, the PEG facilities need upgraded digital tools. To meet future cable-related community needs public access must be able to utilize the attributes of digital video. Analog videotape cassette recorders and editing decks are outdated. Video recording is moving to digital storage media like PC hard drives and DVDs. The recording, editing, and playback equipment of a PEG access station should reflect this digital sea change. Fortunately, this need not necessarily require large new capital expenditures on PEG equipment. The price of digital video quality has followed the same declining cost curve of computers and electronics generally. Furthermore, digital video is more readily transferred back and forth between cable TV and Internet platforms. PEG groups that are able to explore new Internet video platforms and offer access to third party producers who wish to produce video directly for the Web, would provide a valuable side benefit to communities (although cable-based funding sources may not support all such activities if they do not have a tie to PEG access on the cable platform).

Policies

- Community needs and the demand for PEG access services, balanced by cost, should drive considerations of the appropriate number of PEG channels and other PEG capabilities. Indicators of community demand for PEG access services include but are not necessarily limited to:
  - viewership (both the number of people watching and the size and interest level of a "core" viewership),
  - hours of locally sponsored and produced programming,
  - number of PEG access programming hours regularly filled with programming and information of local interest, and
  - levels of expressed community interest in video production training.
- Live origination of local programming from key community sites as well as PEG studio locations is an important public benefit of PEG access.

Table 8.5:
Vermont access management organizations

Started	AMO	Current Number of Channels
1976	Brattleboro	2
1984	Burlington (P)	1
1984	Montpelier	3
1984	Rutland	3
1985	Middlebury	1
1989	Barre	2
1990	Burlington (G)	1
1990	Newport	1
1992	Burlington (E)	1
1992	Shelburne (E)	1
1992	Lyndon/St. Johnsbury	1
1993	Bennington	3
1993	Norwich/Hartford (P)	1
1994	Colchester	2
1994	Richmond	1
1995	Bellows Falls	3
1996	Manchester	3
1999	Springfield	2
1999	St. Albans	1
2000	Windsor	1
2001	Ludlow	1
2001	Waitsfield/Warren	1
2002	Stowe	1
2003	Bristol	1
2003	Shelburne (PG)	2
2003	Woodstock	1
2004	Norwich/Hartford (E)	1
2004	Hardwick	start up
2004	Hyde Park	start up

(P)=Public Access Station, (E)=Educational Access Station, (G)=Government Access Station. All other entries are combined P, E, and G stations.

Source: Vermont Access Network

- Local video production training of community members to produce PEG access programming provides an important public benefit.
- PEG facilities should include the ability to digitally record, edit, and encode video and audio.
- While "cutting edge" video production and cablecasting of PEG access programming should not be required, PEG facilities and channels should be capable of producing and delivering content with high-quality production values in line with changes in technology, viewer expectations, and a reasonable level of PEG funding.
- While increases in channel capacity and system bandwidth should not lead automatically to larger "set asides" for PEG access, cable operators with the ability to deliver more cable content should be prepared to accommodate more PEG access content, if there is a demonstrable community need.
- PEG access entities should not be discouraged from repeating programming at a frequency comparable to that found on commercial cable stations.
- PEG access CPG obligations should bear some relation to the size of the cable system.

Strategies/Action Plans:

- PSB Rule 8.451 is now outdated; terminology specified in the rule should be upgraded to reflect the change from analog video to digital video platforms. The PSB should add the following terms to the definition when next revising Rule 8.400: digital cameras, digital storage media, analog/digital converters, and digital non-linear editing platforms.

STATE-WIDE INTERCONNECT

The PSB's April 2000 order in Docket 6101, the refranchising of many Adelphia systems, breathed life into a concept that PEG access entities and the PSD had supported. This concept, a statewide PEG access network, promises to add value to the existing level of PEG programming. Such a network could improve the Vermont-based programming available to Vermont cable subscribers in a number of ways including:

- Allowing locally-produced PEG programming of special quality or statewide interest to be shown statewide;
- Allowing live access to legislative proceedings, testimony, and other important state government meetings and events, like a Vermont version of C-SPAN;
- Providing a broader audience for educational programming.

The 2003 refranchising of Charter Communications' Vermont system was the first non-Adelphia system to have a franchise condition related to a statewide PEG network. The condition required Charter to interconnect with Adelphia for the purpose of sharing statewide PEG network programming. With Adelphia and Charter participating, the concept would progress further toward being a true statewide network.

Although there have been some discussions and planning, more than one third of the way through the first franchise that called for the statewide network, this important public benefit has not yet been realized. It is time for all parties involved—PEG access groups, cable companies, and the state in its role as franchising authority and facilitator of access to government by the public—to work with renewed effort to make real the vision. One step that would move the development of the network forward would be the designation of an access management organization (AMO) to work with Adelphia, Charter, and other cable companies and to lead in the implementation and management of the network. This AMO may or may not be an entirely new organization. Other possibilities could include adding statewide responsibilities to an existing local AMO or formalizing a consortium of local AMOs.

Policies

- All cable system operators neighboring another cable system operator in the same or an adjacent town are encouraged to interconnect for the purposes of sharing programming and other communication over their network; all new cable franchises should include such interconnection as a CPG condition unless good cause exists not to.

Strategies/Action Plans

- The PSB and PSD should work toward designation of a statewide PEG AMO to manage the statewide interconnected PEG access network.
  - The statewide AMO should be charged with identifying a location for a studio facility if needed, either a new facility or a facility shared with an existing local AMO.
  - The statewide network should provide the ability to (1) receive programming from all Adelphia and Charter local PEG studios and remote origination points, the statewide AMO studio location, and video feeds as available from VIT, UVM, and ILN, as well as state building locations; and (2) deliver live video feeds and stored digital video files to interconnected local PEG access organizations for broadcast.
  - The statewide AMO should be charged with working with Adelphia Cable, Charter Communications, and other cable companies that elect to participate in the network to establish interconnection facilities, video switching between local PEG systems, and digital video storage.

CABLE TARIFFS

Hefty annual cable rate increases exceeding the rate of inflation have become a subject of regular media and congressional attention. While cable companies have accompanied such increases over time with system upgrades, new services, and more channels, consumers are justifiably upset by increases that cost more and more, asking consumers to buy more and more services that they may or may not wish to buy. Nevertheless, state authority in this area is severely constrained. While state law provides the PSB extensive authority to regulate cable rates, federal law pre-empts it and the state currently may not challenge the rates of its cable companies. State law requires cable companies to file tariffs, but the effect of federal law ensures that these are not more than informational tariffs. These filing requirements, while not ultimately determining cable rates,

consume company and state government resources and add a layer of administration and occasional controversy concerning items such as filing deadlines and regulatory notice.

Strategies/Action Plans

- The legislature should grant the PSB the authority to forbear from requiring cable service tariffs as long as federal law preempts state regulation of cable rates or upon a finding that a cable company lacks market power.
- The PSB should ensure basic consumer protections for cable customers through rule in lieu of tariffs.

ELECTRIC UTILITY INVOLVEMENT IN TELECOM

Electric utilities have already played an essential role in the development of Vermont's telecommunications infrastructure. This has come in a variety of forms. As keepers of a major part of Vermont's pole and utility rights-of-way, electric utilities can be an enabler or obstacle to telecommunications development. VELCO's joint agreement with Adelphia more than ten years ago to deploy fiber optic strands around the state was a boon to telecommunications in Vermont and also gave VELCO a private telecommunications network that promotes the reliability of the electric transmission network. Without this kind of partnership, Vermont would have a lower quality and much less robust telecommunications network.

VELCO's joint agreement with Adelphia more than ten years ago to deploy fiber optic strands around the state was a boon to telecommunications in Vermont.

In other states, electric utilities have played a variety of roles with respect to telecommunications development. Some have entered into the retail voice, video, and data market. Others have acted as a wholesale service provider, selling raw transmission capacity or dark fiber to telecommunications companies that provide retail service. In some respects electric utilities are ideal organizations to provide telecommunications service or infrastructure. They have experience with poles and wires, already maintain part of the common infrastructure, have existing customer relationships, have a steady cash flow, and are used to making large capital investments with long payback periods. The idea that electric utilities could provide wholesale infrastructure or raw transmission capacity to a range of retail telecommunications providers is especially intriguing. The telecommunications business has financial risks and low-cost electric power is an important state priority. Therefore, it is important that electric utility investments in telecommunications be able to stand on their own financial merits. There is a balance to be struck by state utility regulators—electric utility ratepayers should not be forced to bear the financial risk of a non-core venture by their utility, but neither should electric utilities receive the impression that efforts by electric utilities to assist in providing another type of essential public service are unwelcome.

Wireless telecommunications and electrical service share a set of siting issues. Although electric transmission and distribution structures differ in many of their specific characteristics, both often require "vertical real estate" in the form of towers or poles. The ubiquity of electric utility structures often begs the question of why wireless facilities are not more often located on these, usually pre-existing structures. In fact, the siting needs of wireless and electric service are

not often the same, but sometimes they are similar. As more and more higher-frequency wireless services, like PCS service and broadband wireless Internet, require more sites in Vermont located closer together, use of utility poles and electric transmission towers may more often be a good solution. If Vermont is to benefit from wireless-electric collocation, there are steps that electric utilities and state regulators can take to make it more feasible. From electric utilities, the wireless service providers require a willingness to work with them to attach antennas to electric utility structures. Since antennas often work best up high, they are often unlike wireline pole attachments. Electric utilities around the country (and to a limited extent in Vermont) have reached agreements with wireless companies to place antennas for them in locations that require trained personnel and special precautions—such as the high points on poles or towers that are near or above electric conductors. From regulators, wireless service providers require clarification on a point of Vermont land-use law. Electric transmission facilities, including transmission towers, are reviewed by the PSB under Section 248 of Title 30, and do not require approval through the local zoning process and Act 250. Through the end of 2003, there had been only one wireless attachment to an electric transmission structure, an antenna providing Sprint PCS service on a VELCO tower in South Burlington. The applicant went through all three permitting processes—local zoning, Act 250, and Section 248. Under state law, Section 248, when it applies, is supposed to substitute for these other two processes, not be an additional layer. Therefore, the state should be clear with wireless service providers who seek to comply with the law about whether the Section 248 process applies when they attach to electric transmission structures.

Policies

- Electric utilities are encouraged to partner with communications companies to leverage electric utility assets and skills in order to create new or improved telecommunications services.
- Collocation of wireless telecommunications facilities on electric utility structures is supported when it can be done safely and without harm to electric service reliability.
  - Electric utilities are encouraged to work with wireless companies to develop economical and safe solutions for co-location of wireless communication antennas on electric distribution and transmission structures, including above electric conductors when necessary.
- Electric utilities are encouraged to evaluate involvement in telecommunications, especially providing or facilitating telecommunications infrastructure in utility rights-of-way when proper financial safeguards are in place for electric ratepayers.
  - Electric ratepayers should not provide cross-subsidies to utility telecommunications activities that are not related to the operation of the utility.
  - Electric utilities should be allowed by regulators to make fair financial contributions to telecommunications projects or ventures out of regulated utility operations when the utility operations receive needed telecommunications services with a benefit proportional to the contribution made.
  - Electric utility operations should receive fair compensation for contributions of time, materials, or other assets to telecommunications ventures. Beyond covering costs, electric utilities should not be required by regula-

tors to maximize the revenue obtained for the regulated utility operation at the expense of telecommunications ventures that provide service to the general public. This is especially true in areas with a marginal economic case for telecommunications service.

Strategies/Action Plans

- The PSB should provide authoritative guidance on the applicability of Section 248 to wireless communication co-locations on electric transmission facilities.

PRIVACY IN COMMUNICATIONS SERVICES

The users of telecommunications networks and services often rely on those networks and services to convey private information. Companies providing communications services often have access to private information about consumers' identity, financial information, and patterns of communications. At the same time, modern computing and telecommunications technologies have brought about a rapid drop in the costs of collecting, storing, manipulating, correlating, and transferring information. New technologies are also opening up new categories of communications, meaning that maintaining the privacy of communications is no longer as simple as enforcing rules regarding the privacy of telephone users. Open disclosure of privacy policies and informed consumers will be important tools for protecting privacy as communications technologies emerge and mature. Consumers will often have expectations of privacy regarding their communications. It is important that companies that provide various types of communications inform their consumers about the level of privacy that their services provide, and keep the promises they make to consumers.

At the same time, the PSD and PSB have taken significant steps to protect telephone consumer privacy in recent years. The PSB's July 1999 order in Docket 5903 created requirements for companies offering intrastate telephone services regarding Customer Proprietary Network Information (CPNI), Automatic Number Identification (ANI), and Calling Party Number (CPN) that reflected corresponding federal rules for interstate services, (CPNI is information available to a telephone company by virtue of its basic service customer relationship. It includes information found on telephone bills, and may detail the types of service used, the amount of service used, and the numbers called and locations called from. ANI and CPN information identifies callers and called parties.) The order also established requirements for telephone companies regarding caller ID blocking and notices of future services with privacy implications. These requirements remain important.

Policies

- Existing PSB privacy requirements on telephone companies providing intrastate telephone service regarding CPNI, AIN, CPN, and Caller ID blocking continue to be supported.
- Companies providing telephone numbers supplied to consumers should protect the privacy of non-published and non-directory telephone numbers.

- Regulated and unregulated providers of communications service to the public are encouraged to provide consumers with their specific privacy policies and inform customers as to the implications for privacy of the services they offer.

Strategies/Action Plans

- The PSD and the Attorney General should monitor developments in technology and in the legal status of communications services and report from time to time to the legislature if changes are needed to update Vermont's law on privacy in communications services.

ELECTRONIC REGULATORY FILINGS

The PSB and the PSD regulate Vermont's telecommunications industry, and while greater availability and use of high-speed electronic services is a goal, ironically the process of regulation before the PSB and PSD depends largely on paper. Tariffs, applications for CPGs, annual reports, docket filings, and various other documents are official when filed with the PSB or PSD in their paper forms. An electronic filing system would provide opportunities for a more efficient workflow and more convenient access to documents held by the PSB and PSD, and it would provide a good example of the use of technology.

Strategies/Action Plans

- The PSB and PSD should make a progressive transition to an electronic filing system for documents required to be filed with either body.

(Endnotes)

[1] 30 V.S.A § 226(b)(h)(1)(I).

[2] The deposit rule, 3.200, saw a revision in 1999, but this was a relatively minor revision, changing the way that interest on deposits is calculated.

[3] Technically, the standards apply to all carriers, not just local exchange carriers. The standards are written in a way that does not fit IXCs, and therefore neither the Department nor the Board have sought to enforce the reporting requirement for service other than local exchange service.

[4] An ETC is a telephone company that has been approved by the PSB to receive federal high-cost universal service support.

[5] 30 V.S.A § 218(a).

[6] In February 2004, the FCC declared that Pulver.com's Free World Dial-up (FWD) service as then configured was an "information service" under federal law and not subject to state commission regulation. The FWD service is a computer-to-computer service that does not provide users with the ability to call people on the PSTN. *Petition for Declaratory Ruling that pulver.com's Free World Dialup is Neither Telecommunications Nor a Telecommunications Service,* WC Docket 03-45, Memorandum Opinion and Order, FCC 04-27 (rel. Feb. 19, 2004).

[7] 7 CFR § 1751.106.

[8] http://www.state.vt.us/E 9-1-1/ReportsToGov/RepToGoven.htm